The Builder.

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The Early Tombs in Egypt.

LEAVING aside the sepulchres of prehistoric man scattered all over the planet and belonging to a period hazy, indefinite, and chronologically immeasurable, the oldest of all cemeteries is the city of the dead in the vicinity of the Pyramids, adjacent to the ancient Memphis. Here, symmetrically laid out in streets, are the oldest dated tombs of the human race grouped beside the Pyramids, themselves larger sepulchres, which tower amid the other smaller receptacles of mortality, as towers and steeples in a modern city stand out amongst the surrounding public edifices and private buildings. The tombs after all have survived the temples and palaces which in the course of time have been ruthlessly swept away, while the destruction of the sepulchres has proceeded at a lower rate, although they, too, are rapidly disappearing under the incessant destruction of modern civilisation. Of twenty-six discovered and described by Professor Lepsius, and twenty-five subsequently found, not a stone remains. They have been all civilised into quarry stone or converted into lime. How many of those now existing will not disappear after twenty years is a difficult problem to solve, considering the effacing fingers, not of old Time, but modern Egyptian. Folios and portfolios may retain the memory of some on a very perishable paper, and, after two centuries, the whole will become a legend, unless some change comes over the spirit of the dream of destruction.

The streets or general enclosure of the cemetery itself was called *kher*, and the individual tombs *mer*, a term applied also to the brick pyramidal roofed tombs or mausolea of the monarchs, Entef and Ranubkheper at the Drah Abu'l Neggah at Thebes, and to the same shape when cut out of the flank of the solid rock and having obelisks in front; in fact, similar to small temples, a form of tomb which continued till a very late period, and was the conventional one of the mortuary chapel till the twenty-sixth dynasty, or about B.C. 600. The tombs of the eighteenth, nineteenth, and twentieth dynasties, or from the eighteenth to the twelfth century B.C., such as those of the kings at the Bab-al-Melook, were called *asut*, a word implying "pipes" or passages, and were the syringes of the Greek writers tunnelled to the length of 120 ft. into the heart of the limestone rock. To these tombs the term *maha*, sepulchre, was also applied, but it is doubtful if the word indicates any special type of sepulchre.

In the cemetery of Sakkarah the bodies of poor people were not deposited in tombs of handsome architectural construction, but pitched into graves about 3 ft. 6 in. under the surface without any special arrangement; their skeletons alone remain without any traces of linen, and they are destitute of coffins; but they are sometimes placed in a roofed chamber covered with a white coating, and the bodies have around them small vases of limestone or alabaster, and bones of oxen.

The tombs of the old period, in the cemeteries of the ancient Memphis, which have any architectural importance, commence apparently as early as the second dynasty, and are continued to the sixth. They are not all ornamented with sculptures and inscriptions, but have the same general appearance, and Mariette has called them *mastabas*, a word derived from the Arabic, and meaning the raised dais, platform, or counter on which the modern Egyptian merchant sits to sell his wares; their ancient name was *asut*. They are of rectangular shape, made of masonry or bricks of rectangular shape rising to a few feet high; their external revetment, when of masonry, consists of square blocks, not always of large proportions; the interior of the walls often of rubble, but the external masonry arranged in ashlar, or the Etruscan style. Although presenting the appearance of truncated pyramids, they are not really so; the angle of inclination is so slight that, in many instances, it would take 400 ft. to make them terminate in a point or apex if their sides were produced. The blocks of which the *mastabas* are built are either of a siliceous limestone, with a bluish tint, or a marly calcareous stone, with a creamy or yellowish hue. Such of these *mastabas*, or sepulchral chapels, as they really are, as are made of bricks fall into two classes, those of yellow and of black bricks, and at the oldest period, apparently as far back as the second dynasty, or B.C. 3,000 of Lepsius, the yellow bricks were in use; for the Egyptians, even at that early age, had discovered the cheap substitute for masonry. The bricks are all sun-dried, and made on the spot with sand pebbles and Nile mud, and measure 0·22 by 0·11 by ·07 of a mètre. The black bricks, made of pure earth and straw, commence at the period of the lower half of the fourteenth dynasty, and continued till the Roman period, measure 0·28 by 0·18 by 0·14 of a mètre. They are all sun-dried; no baked bricks, except the conical ones, found at the Drah Abu'l Neggah, being discovered through the length and breadth of the valley of the Nile, any that have been discovered being due to modern incremation of old sun-dried bricks by chance or design. While the Pyramids are, for the most part, arranged like the diagonal squares of a chess-board, this arrangement, by no means, was adopted for the *mastabas* or private tombs, for, with the exception of the Mastabat el Faraun, the largest of these rectangular sepulchres which has been quite recently discovered to be the sepulchre of the Monarch Unas, of the fifth dynasty, all the others are either of members of the royal family of inferior grade, or else of the high-class functionaries of state who lived and flourished as an old nobility in the court of the oldest of the Pharaohs. It is remarkable that the *mastabas* face north, but not due north, their long axis being deflected to the east enough to account for the change of pole due to the procession of the equinoxes and the change which has taken place of the Pole Star in so remote a period of time. The mass of masonry of these *mastabas* is solid, but they often have at the north-east angle a niche or recess like a door, with jambs and lintel inside, and at the south-east angle, never west, another niche, with a stele of white limestone covered with hieroglyphs, and sometimes a kind of false door. When the entrance is on the north side there is sometimes a kind of hall, supported by two square pillars. The ceiling is continuous, without defect, sometimes, as shown by the researches of Professor Hayter Lewis, imperfectly arched. On the ground are found little vases and others on the soil which covers the *serdab*; these have to all appearance contained libations of water offered to the deceased, or his *ka* or genius. The interior of these *mastabas* consists of one or more chambers, sometimes blank, but more often having the walls covered with pictures and inscriptions. These chambers have been open from the most remote times, and long stripped of their contents, neither furniture nor other objects being found within them. All the objects within are of stone, a table, or altar of libations, at the foot of the false door, having an inscription on the face, or one side only, or often a table of offerings is found on the walls instead. The entrance-door has on each jamb the deceased, or the deceased and his wife, standing. The architrave has the principal scene,—the deceased seated with his wife at a table, and above a dedication to Anubis, not Osiris, for the usual offerings during the festivals in the course of the year. The inner chamber always contains a stele or tombstone, with cornice resembling a façade rarely blank, but generally containing a hieroglyphical dedication to Anubis, the god of the dead, resembling that on the cornice. The steles or tombstones of the old empire are always square, and either monolith or built of blocks, the rounded top not appearing till the time of the twelfth dynasty, and then not on the *mastabas* of Memphis, but in the sepulchres of Abydos. The stele was either inscribed, and then the walls of the chamber were often blank, or else the reverse

Occasionally the steles contain some short account or notices of the deceased, but even then it is limited to the offices or employments held by the deceased, the marks he may have received of royal favour, but hardly ever any details of historical character; for the *mastabas* are as deficient of historical notices as they are of mythological or other information, no divinities appearing in any of the *mastabas*.

The most important part of this mortuary chapel was, however, the *serdab*, an Arabic, not ancient Egyptian, name which has been applied to a recess in the wall of the chapel, and concealed by the facing of the wall, more often south than north, and north than west. This recess is either walled in, or with a square hole. In this *serdab* is only found a statue of the deceased, often of small size, and to this statue is supposed to have been attached the *ka*, or what the Greeks called the *eidolon* of the dead, a kind of double or reflection of the deceased, which had undergone and would have to undergo the same vicissitudes in the future state. It was distinguished from the *ba* or "soul" and the *khaibi* or "shade," and the square hole of the *serdab* is supposed to have been made in order to allow the incense and libations to penetrate to the statue, of which the *ka* has been supposed to be a kind of soul, or else to permit the *ka* to go in and out of its place in the sepulchre. It was an essential portion of the ancestral worship and a modification of polytheism, showing how the statue or form had a kind of inherent soul.

After the *serdab*, the corridor or shrine of the statue, the last and most important part of the tomb, was the sepulchral chamber, to which access was obtained by a well which passed through the masonry of the *mastaba* and ended on the platform. To find this well it is consequently necessary to mount the platform, and the well lies either behind the stele or in the long axis of the *mastaba*, more to the north than the south. Under the old empire, it is from 6 ft. 6 in. to 9 ft. 9 in. square, and is revetted by large blocks of stone passing through the *mastaba*; it pierces the rock of the foundation to a depth of about 33 ft. or 80 ft., and by it the sarcophagus and other things, as well as the persons employed in the construction of the monument, were lowered to the sepulchre. The descent anciently was probably made by a ladder or cords, and at the present day cords are required for the purpose. Arrived at the bottom of the well, a short oblique passage is found leading to the funeral chamber or sepulchral vault, which is square and well built, and amongst the various *mastabas* one only has been found ornamented. The sarcophagus is rectangular, with cover vaulted, but square at the four ends, and is keyed in by a peculiar arrangement, and fixed by mortise and tenons. Some of the oldest sarcophagi are inscribed,—and in them are found the bones of the corpses, which appear to have been simply laid naked, with a slight embalmment, revealed only by a faint odour of bitumen. These were not bandaged, for all traces of linen have perished, although the recently-opened pyramids of Sakkarah, containing the sarcophagi and mummies of Pepi and Haremsaf,—monarchs of the sixth dynasty,—revealed very fine linen wraps for the bodies there discovered. The interior of the sarcophagi found at Sakkarah contained a pillow of wood or alabaster, placed, no doubt, originally under the head of the corpse, and half a dozen cups of alabaster. The floor of the *mastabas* often have the bones of oxen, which, it will be remembered, were also discovered in the second pyramid.

It appears that there are 140 of these mortuary chapels north of the pyramid, that eighty-six of these are inscribed, and that they show a different style of art and development. The first type, which may be as old as Osenephes, of the second dynasty, and continue to Seneferu of the third, exhibit with rude art a curt phraseology and an infantile tone of sculpture; of this class, about four remain. A second class, with finer art and more developed style of inscription, commences about the age of Cheops and descends to the age of the sixth dynasty, or ranges 4000 B.C. to 2000 B.C. Some of the walls of these chapels have been beautifully sculptured, and painted in most brilliant colours, and the subjects of domestic life often published. Ethnologically, the following facts are most important. They all conform to the usual Egyptian types. The flesh of the men, who even at that remote epoch were circumcised, is coloured red; the women, yellow,—the conventional hue of the Semitic races. No Negroes are represented, but with the servants or slaves are seen a number of dolicocephalic men,—the head flat on the top, the forehead prominent, the hair divided on the forehead, the flesh coloured brown. To judge from analogy, especially of colour, these were of the Libyan race, which extended over Northern Africa, and which are known as Tamahu, or Tahennu, are seen at a later period as mercenary troops, jugglers, and acrobats, and in other services of the Egyptians. No European or Semitic men are visible in these early tombs. Perhaps the dolicocephalic race pervaded Northern Africa at the earliest times. The Negroes or Nubians were not unknown at the period of the sixth dynasty, when they were conscribed for military service.

THE LAZARETTO OF THE LAST CENTURY.

(A CHAPTER IN SANITARY HISTORY.)

Most people know, by name at least, John Howard's great book containing the results of his investigations on the condition of the prisons of Europe. A less known, and, we believe, now scarce work by him is that in which he gives descriptions, accompanied by plans, of many of the lazarettos of different seaports, their arrangements and regulations, accompanied by his own ideas in regard to the formation of a lazaretto for England. The book throws a curious light on the condition of sanitary matters in England and elsewhere in the latter part of the last century.

The "lazaretto," the very name of which has an unhealthy and contagious sound, was the buffer interposed by Western Governments against the incursions of the plague, for which probably Europe had in the first instance to thank that very uncleanly nation the Turks. In the arcades and apartments of the lazaretto suspected goods and suspected passengers could be confined at the pleasure of the Government until their health was established. It is difficult to realise, in this day, the conditions with which commerce must then have been hampered, when ships were constantly exposed to a quarantine of from thirty up to sometimes eighty days, and their goods to be unloaded and unpacked in the lazaretto, and often, when passed in regard to freedom from contagion, returned with no little damage from the rough usage they were exposed to in the course of the investigation to which they were subjected.

The first lazaretto described by Howard is that of Marseilles, which in some respects appears to have compared favourably with a good many other similar establishments of the period. In their main features there is a good deal of similarity in the different plans given. They all contain open courts for the inspection of supposed infected goods, places (generally open arcades) for stowing them, and lodgings for passengers judged to be infected, and compelled to dwell under medical inspection at the lazaretto. Of course, anything like the separation secured by the modern pavilion system in the case of buildings for infectious diseases was unknown; but there seems to have been usually a kind of systematic apportioning of the various departments. In the plan of the lazaretto at Genoa, which was much more symmetrical than that of Marseilles, the whole area, a long parallelogram, is divided into two halves, the one half devoted to "infected goods," the other half to "suspicious goods," each of which seems to have been piled in a large court or quadrangle surrounded by buildings, of which the first floor was devoted to lodgings for the unfortunate suspected or infected passengers, the ground-floor and top floor for warehousing the goods. The stairs to the upper stories of warehouses are external, and without any communication with the lodgings on the intermediate floor, which is, perhaps, more than could have been expected. The centre of each of the courts aforesaid was occupied by a small chapel, not for worshippers, but only for ritual, three sides of the chapel being left open, so that the inmates of the rooms round the court could see the elevation of the Host. The two courts are divided from each other by the block of buildings containing accommodation for purified goods, a building with blank walls towards the "suspicious" and "infected" courts, and windows opening on an inner court. This building for purified goods is directly opposite the main central entrance, whence the goods were removed on board ship again; the suspected goods on being landed were turned off to the right or left according to the depth of suspicion with which they were regarded. A burial-ground was always an adjunct to the lazaretto, a painful reminder that the institution was no mere form, but the practical recognition of a real danger. The small extent of it, however, in most of the plans, seems to indicate that no very large proportions of the "suspected" were really under mortal disease. The lazaretto of Marseilles, already mentioned, was much more rambling in plan than that of Genoa, but the unsymmetrical arrangement seems to have risen rather out of the nature of the ground, part of the site consisting of a small promontory jutting out into the sea, than from any special desire to produce a more broken-up and isolated plan. In both these plans, as well as in that of the Venice lazaretto, which is given further on, wells and water basins are conspicuously marked in the courtyards devoted to the exposure of the goods. Perhaps if the merchants themselves, at one end at least of the line of commerce, had in the first instance used water more liberally on themselves, there would have been the less probability of their wares having to be subjected to lustration afterwards.

In describing the Marseilles lazaretto, Howard records for us some curious particulars as to the manner in which a first-class institution of this kind was worked. The first communication from a ship was with the Bureau de Santé, not actually a part of the lazaretto buildings. It had an outer room and two council-chambers. In this outer room were taken the depositions of captains of ships, who came in their boats to an iron grate. "At 2 ft. distance there is an iron lattice, with a door, which is opened only by the servants of the intendants or directors, who are here in waiting, in a blue livery, trimmed with white lace. Here also letters or orders for supplies from the captains who are performing quarantine in their ships, are received with a pair of iron tongs, and dipped in a bucket of vinegar standing ready for that purpose. . . . . In the first of the two council-chambers there were hung up a plan of the lazaretto, and the picture of a person dying of the plague (!), also the names of the directors, and the weeks of their attendance." Towards the gate opening on the town road, there was opportunity provided for those who were detained to communicate with the outer world, by means of the small apartments called *parloirs*. "The *parloirs* are long galleries, with seats in them, situated between the gates, and separated by wooden balustrades and wire lattice. Beyond this there are other balustrades, distant about 10 ft., at which the persons in quarantine may see and converse with such friends as may choose to visit them. The wires are intended to prevent anything being handed to them or from them; and that nothing may be thrown over, and no escapes made, there is a double wall round the lazaretto." Even the admission to the *parloirs*, however, was under limitation. The quarantine of passengers coming with a "clean bill" (of health) was thirty-one days. "But if the account arrive of the plague having broken out in the place from which they came with a clean bill, after they left it, they are allowed no advantage from their clean bill, for in this case they must be confined fifteen days, and also fumigated, before they come downstairs and are permitted to go to the *parloirs*. In case any of the company to which they belong die, their quarantine recommences." The existence of such regulations so lately as 100 years ago shows plainly what a terror the scourge of plague had produced in Europe. Howard, by the way, notes that the delightful process of fumigation, which was repeated *three* times, at a cost of 9 livres, was "by some thought unnecessary," and that it was not practised at Venice.

In the Marseilles lazaretto there is shown a small enclosure in one corner for the treatment of invalids who might be attacked by plague. A large portion of this plan is occupied by "disinfecting halls" for goods; what was the precise process of disinfection Howard tells us with much detail in another place, in speaking of the establishment at Venice, where the lazaretto system was first introduced, as might naturally be expected in the city of all others the most closely connected with the East. At Venice Howard did by the lazaretto what a writer of our own day did by the casual ward,—he determined to become a "suspected passenger" himself, and for this purpose sailed to Venice from Smyrna in a ship that had a foul

bill. His description of his experiences is a sufficiently curious bit of sanitary history to be worth reprinting:—

"Here, after our ship had been conducted by a pilot-boat to her proper moorings, a messenger came from the health office for the captain; and I went with him in his boat to see the manner in which his report was made, his letters delivered, and his examination conducted. The following morning a messenger came in a gondola to conduct me to the new lazaretto. I was placed with my baggage, in a boat fastened by a cord, 10 ft. long, to another boat, in which were six rowers. When I came near the landing-place, the cord was loosed, and my boat was pushed with a pole to the shore, where a person met me, who said he had been ordered by the magistrates to be my guard. Soon after unloading the boat, the sub-prior came and showed me my lodging, which was a very dirty room, full of vermin, and without table, chair, or bed. That day and the next morning I employed a person to wash my room; but this did not remove the offensiveness of it, or prevent that constant head-ach* which I had been used to feel in visiting other lazarettos, and some of the hospitals in Turkey. This lazaretto is chiefly assigned to Turks and soldiers, and the crews of those ships that have the plague on board. In one of the enclosures was the crew of a Ragusian ship, which had arrived a few days before me, after being driven from Ancona and Trieste. My guard sent a report of my health to the office, and on the representation of the Consul I was conducted to the old lazaretto, which is nearer the city. Having brought a letter to the prior from the Venetian ambassador at Constantinople, I hoped now to have had a comfortable lodging. But I was not so happy. The apartment appointed me (consisting of an upper and lower room) was no less disagreeable and offensive than the former. I preferred lying in the lower room on a brick floor, where I was almost surrounded with water. After six days, however, the prior removed me to an apartment in some respects better, and consisting of four rooms.† Here I had a pleasant view; but the rooms were without furniture, very dirty, and no less offensive than the sick wards of the worst hospital. The walls of my chamber, not having been cleaned probably for half a century, were saturated with infection. I got them washed repeatedly with boiling water, to remove the offensive smell, but without any effect. My appetite failed, and I concluded I was in danger of the slow hospital fever. I proposed whitewashing my room with lime slacked in boiling water, but was opposed by strong prejudices. I got, however, this done one morning through the assistance of the British Consul, who was so good as to supply me with a quarter of a bushel of fresh lime for the purpose. And the consequence was that my room was immediately rendered so sweet and fresh, that I was able to drink tea in it in the afternoon, and to lie in it the following night. On the next day the walls were dry as well as sweet, and in a few days I recovered my appetite. Thus, at a small expense, and to the admiration of the other inhabitants of this lazaretto, I provided, for myself and successors, an agreeable and wholesome room, instead of a nasty and contagious one."

This way of lodging persons supposed to have infection, just as if they were prisoners charged with a crime, to whom no sort of consideration need be shown, has its parallel in the former treatment of lunatics in England, of which we get so many hints in the pages of Shakspeare and other writers. It is observable that Howard hints in a footnote that ideas as to sanitary precautions were, in some respects, going back in his day; for instance, that the "pest-houses" or places of reception for those who were plague-stricken, at Venice, had originally been built with windows, which at the time of his visit had been bricked up. "This shows that in the last" (seventeenth) "century, physicians were sensible of the importance of fresh air, and of a free circulation of it in sick words. A different practice, particularly in the small-pox and the gaol fever, was afterwards adopted by medical gentlemen; but we seem now to be returning to the ancient and more salutary practice. Formerly, also, it seems probable that men did not entertain those absurd prejudices against the free use of water in washing themselves and their rooms, which are now" (1789) "prevalent; for, in several of the old pest-houses, I have observed the marks of a greater attention to the means of gaining plenty of fresh water than has been thought necessary in many of the hospitals built these fifty years."

In the course of some of the heterogeneous and exceedingly curious details which are given in the book in regard to the plague, and the various opinions and practice in regard to its cure, Howard records one case of a sailor who, in the madness excited by the disease, flung himself into the sea, and from that moment began to get better, and recovered eventually. Probably plenty of water over him was what he wanted most, though he took the remedy rather late.

The lazaretto at Venice having been the oldest, and in some degree the model for others, Howard devotes a great deal of space to a minute description of its operations and method of working. The health-office of Venice was established by decree of the Senate in 1468, in the midst of a very destructive pestilence, and afterwards ordered in detail into its form as Howard saw it. With the exception of the wretched accommodation for those who were detained, he appears to have considered that it worked well on the whole. It is observable that among the rules it was a standing order that all vessels from the Ottoman ports were to be subject to a quarantine of forty days, without any reference to their certificates of health, the Turks being regarded as so absolutely indifferent on sanitary matters that their word could not be taken as of any value. The operation of purging infected goods, as described by Howard, seems to have been very unscientific and tedious; in regard to such articles as wool, yarn, silk, woollen and linen clothes, &c., it simply consisted in unripping one end of the sack containing the goods and causing the porters of the establishment every day to thrust their bare arms in (the arms being bared to prevent any infection fastening on their dress), and to turn over the stuffs or cloths so as to expose every part in turn to the air, for twenty days; after which the other end was unripped and the same process gone through for twenty days more. If this had any effect upon the infected goods, it must have been to discharge their infectious particles into the air about the lazaretto itself, and render it a veritable pest-house. Beeswax and sponges were purged by putting them in salt water (not stagnant) for forty-eight hours. Animals with wool or long hair were subject to the whole quarantine. Those with short hair were purged by causing them to swim ashore. Probably all that was effected in the forty days of quarantine could be effected in as many hours now.

Howard's observations on the lazarettos he visited led him to plan one himself, of which an illustration is given, and which, like his remarks, shows how far he was in advance of the ideas of his time. He observes, in the first place, that temporary places of detention for such a purpose should be made inviting and agreeable, whereas most of the existing lazarettos were repulsive in aspect at first sight, and as comfortless and dreary as they appeared to be. He accordingly plans his ideal lazaretto with a bowling-green in the centre of the space it occupies; a canal, connected with the sea, runs nearly round it, and between this and the external boundary-wall are small gardens. In arranging the houses for the temporary tenants he came near to anticipating the pavilion system; for they are all dotted separately over the ground, in symmetrical order, but with spaces between them, instead of being so many rooms in one long building as in the lazarettos then existing. He has shown pumps at various parts of the ground for pumping up a constant supply of salt-water from the sea. He shows a boom or chain at some distance from the shore, guarded by small forts or towers, and allowing ingress or egress at only one point, this being to prevent ships under quarantine unlawfully breaking away; and within this space are arranged mooring-places for clean ships on the one side and for foul ships on the other side. Howard was very desirous to get the English Government to erect a lazaretto on this plan, and his reasons, under the existing circumstances, are very forcibly put. He shows that our Government then depended for safety on quarantine performed at a Dutch port, by ships bound for England; which quarantine he knew from actual observation was performed and overseen in a very slovenly way; and he points out at some length how in this manner the Dutch not only might introduce (or allow to be introduced) the plague into England, but that they had also by this arrangement great facilities for working the commerce with Turkey to their own advantage, and at our cost,—a matter which he goes into at some length. The subject is interesting now only as showing the thought and consideration brought to bear on it by Howard, who was a shrewd man of the world as well as a philanthropist.

A great part of the rest of the volume is occupied by Howard's account of his second visit to prisons, &c., in England, which he had previously visited and reported on, and the extent to which his recommendations had been acted upon, and the results obtained where they had been attended to. At one place he gives suggestions for the construction of a hospital or infirmary, which are in some respects remarkably modern in their tendency, and show how long it takes for practical ideas to get acted upon after they have first been suggested. The wards are to have no other apartments over them, to be distinct for medical and "chirurgical" patients, one spare ward over and above the number in use to be always kept unoccupied, each ward to be so set apart as a spare ward in turn; the wards to be washed once a week; each ward scraped and lime-whitened once a year. "The machines at Northwich," he adds, "for supplying the salt mines with fresh air, would be of admirable use in hospitals, especially if situated in close and confined places." These suggestions were made nearly one hundred years ago, be it noted. As a matter of detail, it is curious to observe that water-closets, self-acting on the opening and closing of the door, were in use in the Guy's hospital of that day, and their general adoption is recommended by Howard.

There is far more of information in this book on the then state of sanitation and of medical science in England and Europe. We have picked out only some points of special interest in a book which very probably a majority of our readers are quite unacquainted with, and which bears testimony that Howard was no less a man of sense than a man of feeling.

* So spelt in the original.

† It seems that the use of the word "apartment," to designate a single room only, is quite a modern one, and confined to Great Britain.

DECORATIVE FEATURES OF THE NEW MUSEUM OF ART AT BERLIN.

THE erection of the new museum in Berlin may doubtless be taken as an indication of an increased appreciation of art by the German nation. In addition to the formation of a collection rich in artistic interest, the promoters of this national work have established a school of art which, according to the *Kölnische Zeitung*, already contains 600 pupils, the professors (twenty in number) being men of eminence, some of whom have contributed to the artistic decoration of the building itself.

Rightly judging that architectural beauty should be supplemented by external and internal decoration of a character in harmony with the objects of the edifice, the designers of the structure obtained the assistance of the most talented artists and workers in Germany in the mural ornamentation of the museum. The result achieved in this direction has an interest apart from that attaching to the building itself, as showing the progress of decorative art in Germany.

Three special features of the work have elicited the particular approval of art critics. The exterior has a terra-cotta frieze-work in its lower portions, and in the upper part rich glass mosaic ornamentation. The principal room has on the upper portion of its walls coloured relief work of a varied character. The general character of the decorations is historical, such allegorical or symbolical subjects as are depicted arising in most cases out of the story, thus silently told, of the rise and progress of art from the earliest ages to our own times.

Heraldic devices appertaining to the various provinces of the empire are numerous in the first-named part of the decorations. The most prominent feature consists, however, of reliefs designed by Siemering and Bruno, executed in terra-cotta. These represent various branches of industry in active operation. Goldsmiths, glass-blowers, basket-makers, joiners, embroiderers, &c., are seen engaged at their various occupations; and the *National Zeitung* suggests that the artists must have selected for their models workmen in the several branches indicated, so lifelike are the attitudes and general character of the figures. Tablets with the names of eminent artists are placed at intervals, and the general effect of the terra-cotta work is commended on account of the contrast it affords to the light red brickwork of the building itself.

The effect of the glass mosaics at the highest portion of the building is described as being striking, the gold ground on which the various portions of the work rest contributing much to the general result. The mosaics have been exe-

cuted at Venice from designs by the German artists, Ewald and Gesellschap, who have respectively planned the decorations to the left and right of the central point of the building. Roman art is symbolised by a Roman emperor holding in his right hand a figure of Victory. The Byzantine period is represented by a veiled female with a model of a basilica. As a symbol of Gothic art, a female is shown, bearing ecclesiastical objects, and looking devoutly upwards. Another female holds in her hand an image of one of Bramante's domes, as a type of the Renaissance period. Oriental art is depicted in a series of *tableaux*. China and Japan are indicated by figures holding large majolica vases; India by a female from whose hand there hangs a shawl; Egypt by a figure on a throne supported by sphinxes, while as a symbol of Arabic art there is a woman wearing a helmet and carrying a richly-adorned shield.

The decorations of the principal room of the museum are specially commended as exhibiting a marked advance in coloured ornamentation. This plastic work was modelled in *basso-relievo* by Hundreiser and Geyer, two young artists of promise. The subsequent painting in colours was entrusted to Herr Schaller. The general idea of the work is a procession of all nations, bringing to the new museum contributions of *objets d'art* both ancient and modern. The artists named have availed themselves of the wide scope thus afforded to their inventive genius, in a manner which has met with general approval.

The composition begins in the middle of the north side of the room, above the entrance. An allegorical figure representing the goddess of fame is here depicted. First in the train comes Greece, her youthful yet powerful representatives bearing the tripod and ornamental vessels as symbols of Hellenic art. Then follow the Romans, mature and earnest men, accompanied by a chariot containing the typical sign of ancient Rome, a brazen she-wolf suckling the historic twins; round the vehicle there being placed brass candelabra to represent Etruscan art. Mounted gladiators precede this part of the display. The representation of Byzantine art is symbolic of the rise of Christianity; the figures of priests bearing a model of the Byzantine basilica forming an effective contrast to the preceding portions of the work. The Crusaders next come upon the scene, and clerical figures bearing ecclesiastical objects succeed them, thus indicating the part which religion took in the artistic development of the Middle Ages. We next see the rise of wood-carving, printing, and other arts. The most prominent position on the east wall is given to the German Renaissance era, the tomb of Sebaldus at Nuremberg being a representation especially worthy of notice. Albert Dürer, Hans Holbein, and Cranach are depicted as leading this part of the procession. Towards the south side of the room the Italian Renaissance is treated with the attention it merits. Ornamental objects of many kinds are depicted, including golden drinking-vessels, rich tissues, Venetian glass ware, &c. Amongst the individuals represented are several of those ecclesiastical dignitaries who (as patrons of Raffaelle and Michelangelo) did such good service to the cause of Mediæval art.

Thus about one-half of the available space is devoted to the portraying of Western progress. The opposite side of the room is given to a similar treatment of Oriental art. Starting again from the north side, we are first shown the age of bronze, as symbolised by primitive implements of various kinds. In the next group Egypt is represented by a sphinx borne by appropriate figures. Assyria also finds a place in the pageant. A caravan, laden with all the treasures of India, next approaches; while Indian, Persian, Turkish, and other Asiatic nations have their share in the display. China and Japan are then shown; natives of the former country, carrying a model of the pagoda, while in the latter case a collection of porcelain vases is the symbol of the development of art in the far East.

The south side contains emblems of the seventeenth century. The *faïence* workmen of Delft (with their blue and white vases) carry on the idea suggested by the reference previously made to Oriental pottery. Furniture, carving, and lace are appropriately depicted in relation to the other artistic specialities of the Netherlands. The development of art in the eighteenth century is treated with special reference to the part taken in it by Prussia under her first king. The figure of Wedgwood recalls the progress made by English ceramic art during his lifetime. The two divisions of this pictorial display meet at a point which contains an allegorical representation of Borussia, together with three females bearing the usual emblems of sculpture, painting, and architecture. A powerfully-built man wielding a hammer is symbolical of labour. Heralds are seen inviting the assembled nations to enter the new building dedicated to ancient and modern art. The conception and execution of this extensive work may be alike commended.

The general idea of the designers of the building has been to adopt, whenever possible, original ideas as to decoration instead of confining themselves to existing types.

"CLIMATE IN TOWN AND COUNTRY."

Under this title Professor Frankland gave a lecture on Friday evening (the 10th), at the Royal Institution, which, at the conclusion, came round chiefly to the vexed question of London fog and its cause and cure. From some of the conclusions rather roundly asserted by Professor Frankland we must dissent, as we imagine would not a few of the audience present have dissented, had the custom of the Royal Institution permitted of discussion after the lecture. The position taken by the lecturer was that London fog was wholly the product of London smoke, the obviously watery element of the fog being the result of the vapourised moisture in the form of steam, which is always a constituent, though in a small proportion generally, of smoke. This assertion was illustrated by various experiments in the artificial production of fog in glass retorts, illuminated by a strong beam of light, showing the effect of smoke, of dust and dirt, and of the unpurified atmosphere of the lecture-room itself, in producing fog as soon as the temperature of the air in the retort was lowered by rarefaction. That the smoke gives heavier and more murky colour to the fog, and fills it with particles of a pungent and irritating character, no one, of course, will deny; but that the experiments (which were very successfully carried out, and very pretty to look at) established the fact of the sole guiltiness of the smoke in regard to our fogs, we entirely fail to see. Take the case of the experiment with the unfiltered air of the lecture-room,—what does that prove? The air of a comparatively small and not well-ventilated room, closely packed with people, is certainly likely to be pretty full of moisture, which will be precipitated on the condensation of the atmosphere introduced into the retort to be experimented upon; but it seems hardly a fair test to take that as an example of ordinary London atmosphere.

Professor Frankland's view is, in fact, contrary to experience and to historical evidence. We have recently in these columns drawn attention to the evidence which exists that London fog was as marked a characteristic of the climate of our capital two or three hundred years ago as now, although the smoke production might be regarded as really trifling compared with what goes on now; and if we were to reduce our smoke now to the amount produced in the time of Evelyn, we should be considered to have attained almost to the condition of a smokeless London; yet it seems that in Evelyn's time the complaints about London fog were as decisive as now. Frequently we find London enveloped in a thick dun-coloured fog, while the country adjacent is enveloped in a thick white fog. The inference is too obvious for the most uninstructed mind to overlook. The basis of the fog is obviously the same both in town and country; the smoke gives to the town section of it a darker colour and more irritant chemical constituents, but that is all. We opine that this basis lies in the extensive prevalence of low and marshy land, and consequently of an atmosphere saturated with moisture, around the neighbourhood of London; the smoke unquestionably makes the infliction worse, and the same state of the atmosphere which keeps the moist fog hanging over London keeps the smoke hanging over it also, so that the two play into each other's hands. But that is a very different thing from crediting the smoke with the whole onus of the infliction.

Professor Frankland's remedy is equally open to question. He closed his remarks by telling his audience that the idea of preventing smoke by better and more scientific grates was practically futile, that "no passage" was written up in that direction, because the expense of fitting up the enormous number of fireplaces in London with new grates would be far too large for us to suppose that it could be generally adopted, or adopted in any degree sufficient to make a perceptible difference in the production of smoke. Accordingly the remedy was to discard the bituminous coal altogether, and burn only anthracite or coal of kindred qualities. The bituminous coal was to be used solely for the production of gas and other commercially valuable substances extracted from coal; so that we are to be left no choice but between coke and the anthracite and other slow-burning coal for fuel. If this class of fuel is to be burned in open grates, how will Professor Frankland insure us against the very possible deleterious effects on the atmosphere of our rooms of these slow-burning coals, which produce a poison more injurious to the system than any smoke, and which do not always produce draught enough to carry it off as an ordinary fire does? Close grates or stoves purposely constructed are the only really advisable means of burning such coal in dwelling-houses; and the substitution of these for the present grates would, of course, cost as much as the substitution of improved open grates. In either case, the change can be made in time, though not all at once, and we may in time arrive at the general use of grates which produce little or no smoke. It is, if the public choose to do it, or the law to enforce it, a question of reasonable time only. But when this is done, the London fog, we fear, will not be eliminated. Some of its most disagreeable qualities will have been removed, but that is all; and to encourage the public to think that they have the matter of fog entirely in their own hands in this manner is to raise hopes which will not be fulfilled.

The same lecture brought forward some very interesting and entirely conclusive evidence as to the different effect of various substances in radiating and consequently reinforcing solar heat, leading, among other things, to the suggestion of the possibility of producing artificial winter quarters of warmer atmosphere than the average winter atmosphere. Some practical results might be evolved from the working out of this suggestion. It is worth note that by far the strongest reflector and reinforcer of solar heat is found to be white paper, which stands the highest in power in all the experiments that have been made, in various climates and atmospheric conditions.

FOUNDATIONS.

A Frenchman might say that when people in this country talk of foundations it is often not the foundations, but the foundation of the foundations that they refer to. In fact, this one word is applied to two if not three different things. It is used to signify the bed or bottom upon which a building is to be reared, and it is also used to signify the first course or courses of stones (termed *founds* in Scotland) of the building itself. This is somewhat confusing. The want of precision of language in using one word in two senses in the same sentence or paragraph may frequently render whole pages of a book unintelligible to the general reader or young student, and for every reason it would be better to have distinct terms for the different things.

The earth or rock in which the bed or socket of a building is formed might be termed the *site* or *bottom*,—the prepared surface upon which the first course of foundation stones is laid might be termed the *bed of the foundations*. Methods of giving consistency and stability to this bed, such as draining, piling, connecting, concreting, and asphalting, might be termed fastening, strengthening, or preparing the bed. The lowest surface to which the materials for preparing the bed are sunk might perhaps be termed the *formation level*.

It is proper, and all but necessary, that the architect make himself acquainted with the nature of the whole area of the bottom upon which he proposes to build, and some yards round about it. If the area is large he will be wise if he makes a chart of it. He must never take it for granted that any part which he has not tested is similar to that which he has tested; for to do so is often to make a fatal mistake, which will tell either against the proprietor or the contractor for the works. He should use means to obtain a record of the nature and consistency, as nearly as possible, of the whole extent of the ground.

The extent of the area of foundation varies

from that of a pedestal which occupies a few yards, to that of docks and river and sea-walls, which cover acres of ground. There may be great anxiety over the preparation of the bed of a foundation which is small in compass, as in the case of a seat for a large crane intended to lift many tons at a time; or that of a tall steeple which is to hold a great bell, the oscillations of which will periodically shake it from top to bottom. Such objects must have a firm seat on, and fast hold of, the earth, and must be set in a deep socket.

And here I cannot help remarking incidentally on a result of the modern usage of carrying high-level railways through the heart of cities. The passing trains set the buildings adjacent to these railways vibrating all over. Will this incessantly repeated shaking of the houses loosen their joints, weaken their frames, and render them useless and uninhabitable before their time?

The resistance to sinking and spreading in bottoms of foundations varies from that of hard rock, which only transmits pressure downwards (towards the earth's surface), and which does not allow of its own substance being displaced by weight, and that of water, which transmits pressure in all directions, and allows itself to be displaced and weight to sink in it till the forces acting over and through its whole basin come to a balance. It follows from this that the nearer the substance of the bottom on which you propose to build approaches the consistency of hard rock, the less cutting will be required to prepare the bed, and the less deep will the foundations need to be sunk into it; and the nearer the substance of the bottom approaches to the nature of water, the more cutting will be required, and the greater will the depth to which the foundations have to be sunk need to be.

Sand, when homogeneous, makes a good dry bed. Rock often proves a damp bed, allowing water to work in its pores and creep up the walls, and not affording the facilities for draining away that sand and gravel do. In technical books, limestone and gravel are credited with making excellent dry beds. Moss is a first-rate bottom for *roads;* whenever a skin gets on the surface, the spring of the peat causes roads, whether macadamised or rail, to wear remarkably well. Roads over moss will not cost the tenth part of the sum for repairs that those over rock, sand, or clay do. But for houses moss is a bad bottom every way you take it. It is both unstable and unhealthy. It is treacherous.

The most difficult bottom to deal with is one the parts of which are sectionally different in substance and consistency. One part being, perhaps, as hard as bell-metal, while another lying beside it is as soft as butter. And this case becomes problematical when the bottom is under water, and the line of demarcation between the hard and the soft cannot be exactly discovered and defined. There are two directions in which the sectional parts may lie. They may lie so that the line of demarcation between them is parallel with the sides of the structure about to be reared, or so that it forms an angle with them more or less acute; the latter case being the worse.

When obstructions are met with, it is an important matter that the architect should be able to decide what amount of opposition should be considered of sufficient gravity to cause him to alter his plans. Plans should not be altered for the sake of a trifle. On the other hand, man cannot work against nature, nor accomplish impossibilities.

The processes to be used in dealing with imperfect and unstable bottoms, in order to make a reliable bed for foundations in them, are to be found detailed in all comprehensive books on architecture, civil engineering, and building economy. The great error into which people are apt to fall, is not in the adoption of method, or even in choosing the best method, but in carrying out the method they have adopted to perfection. When there is deficiency in the solidity or the homogeneity of the bottom on which you are to build, whatever remedy you may appoint to make good the deficiency, you must never rest nor leave it till you have attained your purpose, and made a reliable bed for the foundation. Every new foundation he has to lay, is a new study for the architect.

The great advantage of using a coffer-dam in laying foundations under water is, that it enables the eye to see the bottom and all the work that is done. The strata on which the foundation is to rest, and each stone that is laid, are thrown open to vision, and what could be better than that?

Several writers have directed attention to mistakes which have been made at times, in spreading layers of concrete for the strengthening of the bed. The intention in laying down *béton* or concrete is that the whole of the mixture should, when it has solidified, form one fastened mass, compacted like the leather of the sole of a shoe. To bring this about the shivers and gravel must be bound with some cementing material, such as mortar or grout (made either of lime or cement, sand and water). This cementing material should permeate the whole mass of shivers or gravel equably and thoroughly. Care must be taken that it does not run out of the mass altogether, as also that it does not run through it, so as to desert one part and accumulate in another. This is no unnecessary injunction. I have seen the washing out of a portion of many barrels of cement from the shivers into which it was poured. It was in the case of a large iron cylinder, placed in the centre of a river to sustain a bridge, and the interior of which was to be filled with concrete. The water of the river got through the seams of the cylinder, and came out deeply coloured with cement. A large sheet of water was so coloured every tide. In the end it could not be known how much cement remained in the cylinder, nor how it was distributed among the shivers, nor how much of the contents attained the consistency of *béton*, how much remained shingle, notwithstanding the work being done at great cost. The inspector should try to make sure that the proper quantity of cementing material is expended on the shingle and well distributed throughout it, and he can never be wrong before beginning to build upon the *béton* to cause a little grout, made with hot lime or Roman cement, to be run over the surface, to fill any interstices that might possibly remain.

In building a bridge over a river where there is already a bridge, it would be well to bear in mind that the projectors of the first bridge probably selected for it the best site that could be got, and that the site chosen for the second bridge about to be built, is most probably an inferior and less secure position, and that therefore the new structure should be better guarded and more carefully founded than the old in order to make it as secure. A wise man builds his bridge at the ford, a fool builds his at the ferry.

It must ever be a matter of surprise that what was the new bridge over the river at Ayr (Burn's "new brig") having given way at the foundations of the piers, a second new bridge erected in its place, and only two or three years old, is now likewise already showing signs of insufficiency and weakness at the same part, and is causing no end of anxiety to the trustees who have the charge of it. But it is sufficient to remark on this point that the architect having satisfied himself of the depth to which he is to sink foundations which are to be exposed to water, such as sea and river walls, and piers of bridges, should always mark his formation level a few feet lower. Having fixed the level of the bed of his first course low enough for perfect safety, he should calculate upon placing it a few feet lower still. Here, if anywhere, he ought to work upon a broad margin and make assurance doubly sure.

The heaviest part of a building should rest upon the solidest part of the foundation walls. In the handsome steeple of Free St. John's Church, Glasgow, I have observed that the keystone of an arch has been made the foundation of a tall buttress. This is not only bad in principle, but it is displeasing to the eye.

As the foundation of a building is its base, to spread it out is not only conformable to the rules for safety, but also to the precepts of taste.

Whoever wishes to lay foundations pressing equably on their bed, and exactly and neatly, at the same time must make use of powerful implements. It may be said, in a general way, that the instruments and tools with which a builder works at foundations should be larger and stronger than those with which he works at the superstructure in proportion as the pieces of which the foundation is, or, at any rate, ought to be, composed, are greater and heavier than those of which the superstructure is composed. There can be no question as to the great advantage that suitable and powerful implements put into the service of a sensible workman give him. They invest him with extraordinary powers to carry on his job exactly and expeditiously.

Not only should the stones put in foundation walls be the largest put into the building, but if there be any difference in the specific gravity they should also be the heaviest per cubic foot, the heaviest for its size being, in most instances, the strongest too. Stones, as a general thing, are comparatively strong or weak, according as their specific gravity is high or low.

If I now propose to architects and still more to engineers, that they should make the foundations of all their structures, whether seen or unseen, handsome things, I think I hear them retort, "What do you mean? Teach your grandmother! Away, stick to your last!"

The ancients had that idea, however, which they, no doubt, took direct from Nature, that nothing is handsome which is not handsome throughout, and that if you would have anything like a perfect structure, the unseen as well as the seen should be carefully and tidily shaped. "Thorough," a word upon which Lord Macaulay threw some contempt, was their motto; and, besides, it seems not out of the way to suppose that any one who loves beautiful figures and fine forms would incline to draw all the parts of a design handsomely from bottom to top, that he would not begin at the bottom with a hideous foot when he proposed to end at the top with a graceful head, and that his foundation works would be designed to conform to the pattern of the rest of his building, nor to suppose conversely that he who was careless in producing and displayed no taste in designing his foundations would be but a slovenly architect or engineer throughout, and not much to be depended on.

If you ask me what I consider a handsome foundation building, I would give as my example the crypt of Glasgow Cathedral. Perhaps you might reply to me, "Is that a foundation building at all?" My answer to this would be, "Is the crypt of St. Paul's, London, a foundation building? I prefer the crypt of Glasgow Cathedral to the crypt of St. Paul's." To this you might perhaps reply, "But are not the crypts of the churches you name superlative, and rather what might be called superfine examples of foundation works?" To this my answer would be, "That is as you think. My purpose is to pull up the prevalent notions regarding the dignity (not to say the importance) of foundations, not to drag them down."

If the architect have the eye of a painter; beyond that, if he have the soul of a poet, his imagination will revel among the sunken and gloomy recesses of foundation buildings, even as the novelist gloats over the midnight city, the spectral river, and the starlit bridge. Across his heart, running in hot and cold jets, will shoot the elastic lines of the impetuous Byron:—

> "Lake Leman lies by Chillon's walls,
> A thousand massy feet below."

Without the alternation of deep gloom and brilliant sunshine, the world would appear frivolous and unattractive, and the architect, as well as the painter and the poet, will find a certain pleasure in diving down the lanes of deepest shadow in pursuit of beauty ever flying before.

But paramount to that, if in his daily walk he seeks, as he may do, to make his works a faint imitation of Nature, he will find in this model nothing misplaced or misleading to imitate, no false theories or mistaken deductions, no slovenly or reckless practices. Her foundations are always beautiful and strong. W. Y. B.

ENGINEERS AS STATESMEN.

IT is with a very just and natural pride that some of the Continental journals point to the eminence recently attained in public life by several gentlemen belonging to the profession of civil engineer. The most remarkable instance, perhaps, is that of M. Simon Bavier, who has been elected President of the Swiss Confederation, or, as he is more correctly called, President of the Swiss Federal Council. M. Bavier was born in 1825, and studied engineering at the Polytechnical Schools of Stuttgart and Carlsruhe. He was formerly engaged in the construction of some of the Italian railways, as well as in the service of the Swiss Government. He is the author of an excellent technical work entitled "The Roads of Switzerland."

Further examples of engineers proving successful as statesmen are to be found in the new French Ministry. No fewer than three of the members of the Freycinet Cabinet are by profession civil engineers. They are the Minister-President, M. de Freycinet himself, and his colleagues, M. Varroy, Minister of Public Works, and M. Tirard, Minister of Commerce.

"OLD FULHAM BRIDGE,"

OTHERWISE CALLED "PUTNEY BRIDGE."

This was the title of an extremely interesting paper read before the London and Middlesex Archæological Society, on Monday evening last, by Mr. J. F. Wadmore, A.R.I.B.A. The author commenced with some general observations on the changes that have taken place during the last century and a half in the aspect of London from the Thames, and in the aspect of the river itself; and went on to say that it might, perhaps, surprise many people to inform them that the old timber bridge between Fulham and Putney (shortly to be removed) was now the oldest existing bridge in the metropolis over the Thames, and that it was erected with the intention of supplying an immediate temporary want until its place could be occupied by a more permanent structure. Although erected as far back as the year 1729, it had usefully served the purposes for which it was designed, while two stone bridges of later date,—Westminster and Blackfriars,—had become ruinous, and their places were supplied by more recent structures. Since Putney Bridge was opened for public traffic, no fewer than twelve other bridges had been erected over the river to supply the needs of London, viz., Westminster (in 1750), Blackfriars (1769), Battersea,—another wooden structure,—(1771), Vauxhall (1815), Southwark (1817), Waterloo (1817), Hammersmith (1827), London Bridge (1831), Chelsea Suspension, or "Victoria" Bridge (1858), Albert,—or "New Battersea,"—and Wandsworth Bridge, to say nothing of Hungerford Suspension Bridge (removed to make way for the Charing Cross Railway Bridge), and the various railway bridges now crossing the river. Having briefly glanced at the history of Fulham and Putney, and shown that a ferry existed at this point of the river from very early times, Mr. Wadmore went on to say that the necessity of some more certain and better means of communication between the two banks of the river was recognised by Lord Esser, who, when in command of the Parliamentary forces in 1642, threw a bridge of boats over the river to enable him to follow up Charles I., who then lay at Kingston, having retreated from Brentford, crossing the river by Kingston Bridge. There was reason to suppose that this bridge of boats was made use of up to the year 1647, and possibly later. The convenience and facility which it afforded while it remained were too great to be lost sight of or forgotten, and accordingly, in 1671, a Bill was introduced into Parliament for building a bridge over the Thames from Fulham to Putney. Its supporters appear to have met with the uncompromising opposition of the citizens and Corporation of London, and the Bill was lost, on a division, by 67 to 54. The arguments used on the occasion were preserved in Grey's "Debates," under date April 4, 1671. Mr. James, the member for London, stated that the Bill would "question the very being of London. Next to pulling down the borough of Southwark, nothing can ruin it more. All the correspondence westward for fuel and grain and hay, if this bridge be built, cannot be kept up. The water there is shallow at ebb. London requires a free passage at all times." Mr. Walter defended the Bill, observing that "at Paris there were many bridges, at Venice hundreds." Sir Thomas Lee wisely remarked that it would make building at the west end of the town all the better. Sir William Thompson said the erection of the proposed bridge "would make the skirts (through London) too big for the body. The rents of London Bridge, for the maintenance of it, would be destroyed. It would cause sands and shelves, and affect low navigation, and cause ships to lie as low as Woolwich." Colonel Stroude said that in no case were all the bridges of a city built at one time. No city in the world so long as London had only one passage for five miles. Mr. Boscawen remarked, "If a bridge at Putney, why not one at Lambeth? and more?" Sir John Bennett said the Corporation would agree to the bridge at Fulham if they were thereby secured from another bridge at Lambeth. Mr. Love, the Lord Mayor of the year, was, however, of a different opinion. "If," he said, "carts go over, the City must be destroyed." In the result, the Bill was thrown out, as before said, by a majority of thirteen votes. There was every probability that the Act eventually obtained for building the bridge was mainly carried by the aid and influence of Sir Robert Walpole (the centre lock was long known as "Walpole's lock"). There was a story current that one evening Sir Robert was returning from Kingston (after he had been in attendance on his royal master at Hampton Court), to take part in an important debate in the House of Commons. When he arrived, hot and in post-haste at the ferry, to his utter disgust and dismay he discovered that the tide was down and that the ferry-boats were laid up high and dry on the opposite shore, nor was there a ferryman to be seen. It was in vain that he and his servant shouted till they were black in the face and hoarse in the throat. The ferrymen, Tories to a man, were carousing with mine host of the Swan at Fulham, and regaling themselves with beer and tobacco, while they secretly enjoyed his discomfiture. All Sir Robert could do was to ride on, leaving his maledictions on the ferrymen. These were no idle threats. The Act for the building of the bridge received the royal sanction on June 8, 1726 (12 Geo. I.). The importance with which the project was regarded might be inferred from the number and influence of the illustrious list of noblemen and gentlemen (110 in number) who were appointed commissioners to carry out the Act. With a quaint irony which gives point to the story before mentioned, the first meeting of the Commissioners was held on July 26th, 1726, "at the sign of the Swan at Fulham," then a small but useful tavern where passengers waiting for the ferry could resort and find refreshments. The proceedings must have been conducted in the open air, as it was not possible that accommodation for the sixty-eight noblemen and gentlemen who then attended could have been found in the humble hostelry. One of the resolutions passed at this meeting (at which there were present, among others, "Nicholas Dubois, Master Mason; Thos. Ripley, esq., Cont' of H.M. Works; and Will Kent, esq., Master Carpenter") was, "That such a bridge be built as may supply the present exigency, and be useful for the building of a more substantial bridge, as there may be occasion." A committee, consisting of the greater number of the commissioners present was appointed to receive proposals for the erection of the bridge and to report thereon. The committee gave instructions for a survey to be made of the river, showing the different places where a bridge might be erected, and Mr. Thos. Ripley reported on three places, "Firstly, from Putney to Mr. Gray's land at Fulham; secondly, from Brewhouse-lane to Fulham Dock; thirdly, from the east corner of Mr. Prittlewell's gardens to the carpenter's yard at Fulham." The committee having considered the three, selected the first, where the width of the river between the banks was 780 ft., with 18 ft. of water at high tides and 6 ft. at low. Three designs for the bridge were next submitted for the approval of the committee,—the first from Mr. Thos. Ripley, the second from Mr. John Price, and the third from Mr. William Halfpenny. Mr. Ripley proposed to build a bridge 23 ft. wide and 780 ft. long, the centre lock to have 17 ft. of waterway above the highest tides; the piles to be 15 in. in diameter, shod with iron and driven 6 ft. into the bed of the river. If built entirely of fir, he estimated the cost of construction at 8,000*l.*, including pavements (abutments) at the ends of the bridge; that the annual repairs would cost from 50*l.* to 60*l.*, and that the work could be completed in two months and would last for from twelve to fourteen years. He further added that he did not think that any wooden bridge, though of oak, would last above thirty years. If the piles were of oak the cost would be 9,000*l.* The roadway was to rise 9 in. in every 10 ft., and the bridge, when erected, "would be useful in the nature of scaffolding for the erection of a stone bridge." Thomas Ripley was born in Yorkshire, and is said in his early days to have kept a shop and coffee-house in Wood-street, Cheapside. He was admitted to the freedom of the Carpenters' Company in 1705, and by the interest of his patron, Sir Robert Walpole, obtained the appointment of clerk of the works at the King's Mews. He subsequently became Chief Carpenter, then Controller of H.M. Works; and lastly, Controller-General of the Works, Buildings, Gates, and Bridges, as well as Conductor of the Royal Progress. His principal works were the carrying out of Charles Cambel's design for Houghton Hall, Norfolk, for Sir R. Walpole; Wolaston House, Norfolk; the Admiralty, Whitehall; and many other works and buildings. He died at his official residence at Hampton Court, February 10, 1758, and was buried in the parish church. His name was mentioned by Pope in connexion with the erection of the proposed bridge in a somewhat disparaging way,—

"Who builds a bridge who never drove a pile,
Should Ripley venture, all the world would smile."

Mr. John Price submitted a plan and section of a bridge, to be 20 ft. wide, with a total length, including abutments, of 852 ft. from high-water mark, to be divided into nineteen bays, from 45 ft. to 30 ft. wide, so as to allow 685 ft. of navigable water-way, to be 12 ft. 6 in. high above high-water mark. He was of opinion that the bridge might be built for 8,600*l.*, and completed within nine months. With oaken piles, 18 in. in diameter, as he proposed, he thought the bridge would stand for fifty years. The annual repairs were estimated at 100*l.* per annum for the first seven years, and 200*l.* per annum afterwards. Mr. William Halfpenny submitted a plan for a bridge to be 24 ft. wide, with nineteen bays or openings, to be 32 ft. wide each, and to be 16 ft. above ordinary and 12 ft. above the usual high-water mark. He proposed to build the bridge wholly of oak, and estimated its cost at 2,800*l.* He reckoned that it would take about a year and a half to build, and would stand about thirty years, costing about 500*l.* for repairs. Objection appears to have been taken to the plan submitted by Mr. Price, on the ground that the bearings between the piers were supported by a king-truss on either side of the bridge, that the middle would be necessarily weak, and require a cross-piece, which would throw the whole weight on the king-post. Mr. Price fully explained to the committee the nature of a truss, and endeavoured to throw discredit on the plan submitted by Ripley, by saying that the piles could not be driven down as proposed by him without splitting to pieces. A plan and model for a bridge of boats were also submitted, which, it was stated, could be finished in two months, and would cost 5,000*l.*, the repairs being estimated at 300*l.* per annum. In this bridge of boats there were to be two openings of 24 ft. each for barges, and thirty of 12 ft. each for wherries. The committee finally came to the conclusion that Mr. Ripley's plan should be adopted, and oaken piles used. The feet of many of the original piles now exist, although most of them have been scarfed with other timber, as the decay has been between wind and water, about halfway up. The committee then invited tenders for the erection of the bridge. Three were submitted,—firstly, from Mr. Thomas Hall, carpenter, for finishing the bridge by Midsummer Day, 1727, at a cost of 7,500*l.*, one-third to be paid when one-third of the work was completed, one-third when two-thirds were finished, and the remainder on the completion of the work. Secondly, Mr. Thomas Phillips offered to undertake to finish the bridge in two months, if required, for the sum of 6,698*l.*,—one third to be paid at the beginning of the work, one-third when half was done, and the remainder when the bridge was completed. Thirdly, Mr. John Meard, carpenter, undertook to finish the bridge in two months for 6,650*l.*, payments to be made as in the proposal of Mr. Phillips. The committee agreed to accept Mr. Phillips's tender to build the bridge, with oaken piles, for the sum of 6,698*l.*, he giving security to keep the work in repair for twelve years, accidents by fire and damage by barges alone excepted. Further tenders were then entered into with Mr. Joseph Andrews, mason, for stonework amounting to 1,756*l.*, and with Mr. John Mist for roads and paving at 6*s.* per yard square, he keeping it in repair for twelve years for 50*l.* per annum. These matters being settled, the committee proceeded to consider the rights of the ferry, that on the Middlesex side being held of the Manor of Fulham (of which the Bishop of London was lord), while that of Putney was held of the manor of Wimbledon, whereof Sarah, Duchess of Marlborough, was lady. Mr. Ripley's plan appears to have met with some outside criticism other than Pope's, notably from Mr. John Gregory and Mr. Thomas Beal, who suggested remedies for certain defects which they thought they detected in the design of the bridge. In a petition which they addressed to the Commissioners, they say,—"When the ice is frozen hard to the piles, they standing naked, as usual, with the small ends downwards, when the tide comes strong under the ice it will probably heave up the bridge, and loosen the ribs in the ground, and rack the braces and framing at the top. Then there may come a sudden thaw, and the sholes of ice which will be brought down the river with the landfloods will drive hard against the bridge, and it

being top-heavy, and before loosened and racked by the frost, it is, in our humble opinion, in great danger of being overthrown. Therefore, to prevent such a casuality, if we are employed in it we will take such a method as we have put forth in the following proposals." This method appeared to be the fixing of the larger ends of the piles downwards, "to be turned in with an engine," as "the butt-ends had most heart," and, tapering upwards, the piles would be the better able to resist the ice; also, to "warp" the piers on every side with planking. The petition concluded with the following words, —"We being the root of this contrivance, it is to be hoped you will not permit any branch of it to be grafted into any others' proposals." Financial and legal difficulties having arisen, partly out of the extent of the claims made by those interested in the ferry rights, some delay was caused, and other designs were invited. There were three responses, one from Captain J. Perry, of Rye, who, after saying that he was then engaged on works connected with the harbour, &c., offered to build a bridge "by a new method not yet practised in England." Secondly, one Richard Newsham offered to construct a bridge "for a small sum of money, to last longer and better than any others"; and, thirdly, Mr. J. Goodyear submitted scantlings for a bridge, but declined to be an undertaker and accept a mortgage of the tolls as payment. At a subsequent meeting Mr. John Price sent in a model for a stone bridge, which he estimated to cost about 45,000*l.*, and eventually the Commissioners, by deed of assignment, made over the undertaking to thirty gentlemen, amongst whom were the Earl of Halifax, Sir Robert Walpole, Sir Matthew Decker, baronet, and Sir Charles Wager, knt., who had agreed to subscribe the sum of 1,000*l.* each. The first meeting of the proprietors was held at the Lottery Office, Whitehall, on Nov. 27, 1728, when several models and designs were considered. 1. The model and design for a timber bridge previously submitted by Mr. Ripley. 2. Mr. Price's model of his proposed stone bridge, already mentioned, "together with the model of a timber one of the same kind with that which Julius Cæsar built over the Rhine," and estimated to cost 20,250*l.* 3. Mr. Halfpenny's design for a timber bridge, previously laid before the Commissioners. 4. Mr. Goodyear's design for a timber bridge. 5. A model of Captain Perry's proposed bridge. 6. Two several designs for timber bridges by Sir Jacob Ackworth. All these were referred to a committee, and they reported in favour of Mr. Ripley's proposal, if the piers could be built of moor-stone at a cost of 15,000*l.* Mr. Ripley did not procure any estimate, but stated that the cost would be about 16,500*l.* Mr. Ripley's design was therefore rejected, and that of Sir Jacob Ackworth accepted. The width of the centre opening of the bridge was to be 28 ft. wide; there were to be four openings, each 25 ft. wide, and all the other openings were to be 15 ft. wide each. Eventually, Mr. Phillips undertook to carry out the work for 9,600*l.* To complete the approaches to the bridge it was found necessary that about 200 square feet of Putney Churchyard should be purchased, and a faculty for this was granted in 1730. A careful examination of the minutes of the earlier meetings of the proprietors shows that although Sir Sir Jacob Ackworth's design for the bridge was selected, it was materially modified in execution. Its construction was superintended by a committee of eight of the proprietors, of whom Mr. William Cheselden, the eminent surgeon, appeared at one time to take the chief part. The interest shown by Dr. Cheselden in the construction of the brick arches and abutments, and arranging for the toll-houses, gave no doubt some colour to the statement made by Faulkner, in his "History of Fulham," that Dr. Cheselden gained his experience in architecture while practising as a surgeon in Chelsea Hospital, "which enabled him to design a bridge standing on so many wooden legs." At a meeting held at the Lottery Office, Whitehall, July 2, 1730, the following resolution appears to have been passed:—

"Resolved, as the bridge is built entirely according to a scheme and principles laid down by Mr. Cheselden, and as he has been very serviceable in directing the execution of the same, that the thanks of the proprietors be given to him for the advantages which have been received from his advice and assistance, they being of opinion that no timber bridge can be built in a more substantial and commodious manner than that which is now erected."

The first carriage that passed over the new bridge was that of H.R.H. George, Prince of Wales, Nov. 22, 1729. With sundry repairs from time to time, and with certain alterations of late years to meet the wants of the river traffic, the bridge has continued in use down to the present day. Under the Metropolis Toll Bridges Act, 1877, the bridge was opened free to the public on the 30th of July, 1880, by H.R.H. the Prince of Wales, the Metropolitan Board of Works acquiring the rights of proprietors of the tolls for the sum of 58,000*l.* Subsequently, the Metropolitan Board of Works obtained an Act giving them power to pull down the old bridge and the aqueduct erected by the Chelsea Waterworks Company in 1849, and to erect a new bridge combining the utilities of each structure.

By the courtesy of Sir Joseph Bazalgette, Mr. Wadmore was able to give a few particulars of the new bridge, which will shortly be commenced. The proposed site of the new bridge is about 150 ft. higher up the river than the old bridge, so as to obtain better gradients on the Fulham and Putney sides by making the approach from the former direct from the termination of the present High-street, passing in the rear of the vicarage, and through the garden. The new bridge will be constructed entirely of granite, with five segmental arches, the centre one having 144 ft. clear waterway, with a height of 20 ft. above Trinity high-water mark. The total length of the bridge between the abutments on either side will be 700 ft., with a width of 44 ft. The total clear waterway will be 628 ft. The cost, with the approaches, will be not less than 200,000*l.* The water from the Chelsea waterworks will be carried under the footways in four pipes of 24-in. diameter, and two of 12-in. diameter, three being placed on either side.

A brief discussion ensued, in the course of which the chairman (Mr. J. G. Waller, F.S.A.), the Rev. Hawley Clutterbuck, and Messrs. George Lambert, F.S.A., Alfred White, F.S.A., G. H. Birch, A.R.I.B.A., and S. W. Kershaw, F.S.A., took part, the last-named speaker referring to the ancient ferry from Lambeth Palace to Westminster. Until within some seventy or eighty years ago the water-stairs and water-gate existed. The ferry was much used, and is mentioned in Archbishop Laud's "Diary." In the library of Lambeth Palace there is preserved an interesting document, dated 1701, signed by the Lords of the Admiralty, and bearing the Admiralty seal, exempting the Archbishop of Canterbury's bargemen from impressment into the king's service.

Mr. Lambert afterwards read an interesting paper on "Pewter."

THE CONSTRUCTION AND ARRANGEMENT OF THEATRES.*

It is fully well known that the existing arrangements of sheet iron or wire curtains fail almost without exception in the hour of danger. The value of wire curtains, moreover, remains problematical. The committee have, therefore, come to the conclusion that only a permanently acting, perfectly fireproof screen, which keeps out the gases of combustion, will offer sufficient security. By this they desire to say that the curtain must be a fireproof screen running in an iron casing, which, because always in use, shuts off the stage at once and unfailingly from the auditorium in case of fire, and by means of which the fire may be localised on the stage, which must be sacrificed under any conditions. Supposing such a screen to exist, one half of the theatre,—the auditorium,—might be preserved perfectly intact, a condition never before attained. But by this means a very much greater advantage might be obtained, namely, that, in future, fires in theatres would occur without a loss of life. The greatest guarantee would be offered by the knowledge of the public that there is no danger, in consequence of which the excitement and anxiety to get to the doors, easily explained under present circumstances, would disappear, and the theatre be emptied in an orderly manner. This condition of a permanent fireproof curtain has been specially treated by Mr. Carl Pfaff, and the committee are able to refer to the result obtained by that gentleman as a practical solution of the theoretical problem proposed by them. At the request of Mr. Pfaff, this matter was submitted to a sub-committee for examination, who have dealt with it in detail. Their report is published in an appendix.

The theatre being thus divided into two perfectly isolated parts, there remain only those arrangements to be considered which provide for the safety of those who, in case of fire, are present in either half. As regards the stage, where a fire is almost sure to originate, it would be necessary to separate it completely and fireproof from the rooms used by those engaged on the stage. This object may be attained by enclosing the stage itself on all sides by fireproof walls; in this manner the fire would be confined within that space, and it might be allowed to burn itself out, the efforts of the fire brigade being directed towards rescuing persons engaged therein. At the same time, the roof for this part of the theatre ought to be of very light construction, and the whole well ventilated, so as to permit the flames to find a ready outlet. From this point of view, and looking upon the square formed by the stage as the seat of the fire, it would be advisable to provide the three walls not turned towards the auditorium with as many fireproof passages as there are floors; the dressing-rooms, wardrobe-rooms, and other accessories to the green-room, which would require daylight, would be ranged around the stage, outside the fireproof walls. On each side of the stage at least one flight of stairs for the corridors ought to lead into the open. Should a back stage be required, it would be necessary to establish a fireproof communication between the corridors on both sides of the stage above it.

In the auditorium, which may be supposed to be constructed perfectly fireproof at least in its communications, the latter are of first importance. The passages ought to be constructed with regard to the number of persons assembled in the various parts of the building; but provision ought also to be made to guard against undue crowding in cases of sudden evacuation. The task imposed upon the architect from this point of view will induce him to design the building in such a manner as to dispose of the crowds, which vary in different parts of the house, most effectually. He must divide them into as small bodies as possible, each of which should be able to reach the open as quickly as possible, by the shortest route, without encountering obstacles, and without coming into collision with other parties leaving the house. If we examine existing theatres from this aspect, it will be found that they supply that accommodation in very rare instances to the extent required. Leaving old theatres quite out of the question, in which much arose from accident, and a greater part from other considerations than those here mentioned, it is only too often found that demands are made upon a given site of limited dimensions which render it impossible for the architect to provide communications corresponding to the number of spectators in the sense here pointed out. But most of the theatres are faulty in that there is a want of direct ventilation.

As theatres are intended only for illumination at night, it is frequently thought that daylight may be dispensed with. But where daylight is absent, fresh air may be procured only at a heavy expense; and yet it will not be denied that fresh air cannot be dispensed with in theatres. The fact alone, that most of those who have perished during fires in theatres have been suffocated, ought to prove the necessity of throwing as much daylight as possible into the communications. But the want of fresh air shows itself also in another way. Let us examine the obstacles which oppose themselves to a plentiful supply of air under such conditions. In most theatres, corridors, stairs, and vestibules are grouped round the auditorium, and are again surrounded by other rooms receiving their light direct. Under such conditions, the hall formed by the auditorium and the passages attached thereto not only supply increased danger in case of fire, but they also become a source of various diseases for the thousands of people who are nightly crowded together there in a heated atmosphere. As a plentiful supply of air in theatres cannot be given by artificial ventilation without great expense, natural ventilation offers itself as a ready means of solving the difficulty. If once the principles of safety and sanitation, hitherto neglected, are thoroughly recognised in the construction of theatres, and more particularly in the part in which the public assemble, old-established habits will give way and improvements will follow as a matter of course.

* See p. 155, *ante*. Report of the Committee appointed by the Austrian Society of Engineers and Architects (Vienna).

Hitherto the communications in theatres have been planned on a system of centralisation; its place will have to be taken by decentralisation. With this view, a sufficient number of staircases and passages connected with them will have to be provided, in the first place; in the second place, however, account must be taken of a suitable division of the communications, corresponding to the movements of people in theatres, the largest number of staircases being placed in those parts where the public are congregated in largest numbers. The definition of those requirements by itself presents great difficulties. What is meant by sufficient communications? How many doors of exit are to be provided for a certain number of people, and in what proportion ought the number and dimensions of staircases to be to the number of doors and the people present respectively? It will be difficult to give exact figures, as various changing factors, such as the length of the passages, the form and winding of stairs, the width and steepness of steps, exert a great influence upon the rapidity of the movement of bodies of people. The true solution of these problems in each special case will depend upon the architect, who will have to take due note of such points as are contained in his instructions. He will have to keep to the programme laid down for him as nearly as possible, as a matter of course; but he will do well to adapt his conditions as much as possible to the classic theatre, with its well-devised system of numerous stairs and passages. We do not mean to indicate that he should simply take the classic theatre as a pattern, and entirely break with our present system of boxes. The communications required must be made conformable to the plan of the theatre; but it seems desirable, for this very reason, to refer to the classic theatre, because the same advantage achieved by ancient architects ought to be attained in the modern theatre.* If full cognisance is taken of these conditions, changes in existing arrangements and the elaboration of a new system will follow by themselves. It would be unadvisable to lay down hard and fast rules, but the following particulars may well serve as a guide, referring, as they do, to practical requirements. They would, of course, not be acted upon in the case of grand staircases, nor apply to dispositions made for special comfort.

(*a*) The communications for the various tiers, each of which ought to have at least two sets of stairs, should be independent of each other. They should be in the right proportion to the number of people which each tier will accommodate, and be as short as possible.

(*b*) The communications should be on a more extensive scale in proportion to their length,—that is to say, the upper tiers ought to be provided with more staircases, because they contain a larger number of people.

(*c*) A larger number of staircases of moderate width (say 6 ft.) is to be preferred to a less number of very broad stairs.

(*d*) The turnings should be uniform, and should be easy. Steps and landings should be on a uniform scale. The height of rise should be of the same proportion throughout.

(*e*) Single steps should be entirely avoided.

(*f*) Direct staircases are to be preferred to spiral ones.

(*g*) The passages destined for the public must in no case be intruded upon by the cloak-rooms. The latter may be constructed along the passages for the purpose which they serve, but they must have their exits placed in such a manner as to enable people using them to leave them without entering the general stream.

(*h*) All doors must open outwards: a police regulation made at Vienna long ago.

If communications were constructed as above pointed out and other precautions adopted, crowding dangerous to life and limb would be an impossibility. The masses would, by natural impulse, try to gain the doors, and even the largest theatre might be emptied in a very few minutes. Even in the case that smoke were to enter the auditorium and passages,—which, however, is to be prevented by other measures,—the stairs or passages leading to the open air might be at once ventilated by opening the windows or smashing them, and the danger of suffocation would be avoided. Absolute darkness would also be prevented, as such passages would be partially, however slightly, lighted from the street lamps.

In summing up what has been stated, the committee express it as their opinion that the greatest guarantee for the safety of the theatre-goer is offered by the construction of a sufficient number of staircases, simply and practically arranged, and corresponding to the number of spectators and their distribution in the theatre, as well as by the possibility of ventilating them and the corridors connected with them. They, however, deprecate all makeshifts in the form of balconies, ladders, iron safety stairs, and other precautionary measures, excepting so far as they may be necessary for improving the condition of existing theatres. The same principle which the committee have laid down for the iron curtain applies also to the other arrangements. They must possess stability, and the public must be acquainted with them by their daily use. It is only in this manner that the public will acquire confidence in them, which can only be expected if a conviction of the perfect safety afforded by them gains ground. The behaviour of the public, however, who, in the hour of danger, must help themselves, will be of greater value than all measures of safety devised for cases of emergency, and which generally fail. To make a virtue of necessity was the beginning of all art. We may be convinced that also in the case given necessity will lead in the right direction.

The preceding inquiry has resulted in the formulation of a series of principles which might in the future become rules for the construction and arrangement of theatres. In continuing to test those conditions, a number of determinations of detail may be evolved from those general principles which may increase the safety and comfort of the public. The committee, considering that at the present moment it is only required to set things generally right in this highly important matter, think that they may properly exclude from their labour every detail which would result, as a matter of course, from the due observance of generally valid principles. It is true that there are other points of inquiry not at all or only slightly touched upon here, which are of essential importance in the construction of theatres: such as their warming and ventilation, lighting, water-supply, and the extinction of fires. Notwithstanding their great weight, the committee thought it better to abandon a closer treatment of those questions, for the following reasons. The far-reaching claims which may be made in the construction of theatres upon the arrangements for warming and ventilation, as well as the effect which they may have upon fire-risks,—while, on the other hand, that peril may be greatly diminished by suitable contrivances for ventilation,—could hardly be defined in such a manner as is required by the object which the committee have in view. They think, on the contrary, that the more minute treatment of this branch of the inquiry may be safely left to the investigation of the many experts of our society who have made that department of technical science their special study, and who are, therefore, best fitted to deal with the reforms required. But the question of lighting is of such extreme importance that the committee deem a brief reference to it necessary.

Two reasons suggest themselves for entering into the lighting of theatres. In the first place, the present mode of lighting the stage is the principal cause of fire; and, secondly, it must be most imperatively insisted on that the lighting of the auditorium and the communications must, even in the case of fire, never wholly cease. It may be remarked with regard to the first point that the great number of gas-lights fixed on the stage, often very closely to or between easily inflammable materials, raise the temperature on the stage generally to a very high point, which, especially by radiation, reaches a very dangerous local intensity, and completely prepares for ignition the already very easily ignitable materials forming the scenery, &c. It is here that the danger lies which is inseparable from a stage lighted by gas, and it is, therefore, highly desirable that the stage, in its principal parts at least, should in future be lighted by electricity. The committee are not at present in a position to make definite proposals for a particular system of electric lighting, but they expect from the progress with which electrical engineering is continually surprising the world that the want here expressed will soon be met. A solution of this question may all the sooner be expected, the more managements of theatres are willing to lend a helping hand to experiments, to which they are most earnestly invited. Although, on the one hand, electric lighting must be decisively recommended as highly desirable for the stage for reasons of safety, the lighting of the auditorium and communications may be left as at present. In that part of the theatre electric lighting may heighten the effect, and may also reduce expense, but would not increase its safety.

Whatever system of lighting may be adopted for the auditorium and its approaches, it must never be confined to a single source of light and exposed to complete extinction by accident. It must be expressly emphasised that this demand is made, not only for the case of a calamity, but also for daily routine; for the sudden collapse of the lighting arrangements in a theatre otherwise perfectly in order and filled with spectators would, without further aggravating circumstances, prove by itself a lamentable catastrophe on account of the confusion caused thereby and its consequences. The committee are of opinion that an emergency system should be entirely done away with, and that there must be a supplementary system of lighting. The committee understand by this an arrangement for lighting the auditorium and its communications by means of oil lamps or candles, which forms such a large part of the regular lighting by gas or electricity that it cannot be dispensed with also for daily use, but is necessary for obtaining the full lighting effect under all circumstances. This supplementary system of lighting would thus be placed under the most efficient control,—that of the public. Care should be taken that managers of theatres do not hide the absence of a well-acting, but, to them, inconvenient, supplementary system by a too brilliant lighting by gas or the electric light, and thus withdraw it from the control above pointed out altogether. On the other hand, it would appear perfectly admissible to light that part of the theatre exclusively by oil lamps or candles. On stairs and in passages, in vestibules and lobbies, the lights serving the supplementary system ought to be ventilated from outside. Entrances and doors must be distinguished by recognisable lights belonging to that system. As long as a theatre possesses, besides the supplementary system, one for gas, the pipes of the latter leading to the stage, the green-room with its passages, and the auditorium with its approaches, should not be connected with each other, but should have independent communications with a main, and not be interrupted by any intermediate contrivances.

As regards all further measures for the general safety, especially the extinction of fires, the committee are of opinion that they would exceed their function were they to treat that question. But they are perfectly convinced that the competent authorities who have hitherto administered such measures would be best able to suggest desirable reforms.

The principles above stated might form a guide in the construction of new theatres. In adapting old theatres, those fundamental maxims should be applied as far as possible. The same principles should also serve as a guidance in framing or amending existing building regulations for theatres. How far by legislation alone the safety of the public may be provided for, and how far it may be commendable to determine the construction of theatres by law,—in order not to restrict the liberty of technical science and art too closely, and to avoid making the object legislated for appear merely the expression of existing regulations, as is the case already in many other departments,—requires careful consideration. But under all circumstances, it appears to them of the utmost necessity to encompass theatres by a number of measures of safety of a technical nature, and to co-operate in insuring to theatres at least that proportion of safety which is provided in the working of railways and steam-ships. But even in existing theatres provision must be made for affording an increased degree of safety to the public, by adapting them to the necessity of the case.

This object might perhaps best be attained by the appointment of a central commission of experts at Vienna, which ought to examine all plans for new theatres or for adaptations of existing ones, and to pronounce upon them.

In concluding their report, the committee think it incumbent upon them to add a few general remarks, which have reference to the Austrian system of public architecture, and which may serve to throw additional light upon

* The references in our columns to the classic theatre appear to have reminded inquirers in all parts of Europe of the lessons to be learned from it.—Ed.

the question treated. The committee have drawn attention, to the best of their knowledge, to the evils connected with theatres, for they felt that the means for improving existing shortcomings could be provided only by acknowledging and fearlessly stating the truth. As it might appear from what has been stated as if the architect were responsible for many of the defects exposed, the committee consider it their duty to direct attention to the conditions which exonerate the Austrian architect from the responsibility for numerous mistakes, errors, and omissions in the construction of buildings, or very nearly hold him blameless in such matters. It has often been pointed out, and with regret, that the architect in the Austrian Department of Public Buildings enjoys no independence; he is merely the subordinate of administrative officials. The architect, or engineer, is used only where and how he may be considered fit to be called in. He does not enjoy the authority such as the exercise of technical instructions requires, nor is he permitted the initiative for independent dispositions which may appear to him advisable. He is the organ whose advice is asked in each individual case, without being sure that it will be acted upon. In most important technical matters it may happen that the view of the layman prevails over that of the expert.

If the present high point of excellence of architecture in Austria is here referred to, this fact must be supplemented by the statement that this eminence in detail is the result of a decided art influence, while there is an absence of great architectural principles and of a generous care for architectural interests. Having regard to this much-felt want and to the abnormal conditions existing between the tasks imposed upon architecture and the organisation of the Austrian Department for Public Buildings, the committee feel bound to insist most strongly upon the necessity of reform, long asked for, in that department, and upon the appointment of a superior authority, consisting principally of experts, with independent powers. In carrying out such reforms, an organisation would be called into existence which would formulate a number of useful regulations, and which should be specially referred to in this case.

In all countries where architecture is cultivated, each completed building is placed under the supervision of its architect, as well as each public edifice under the care of a duly qualified expert, who appears to be responsible for its preservation and appropriate use, and for all architectural alterations and arrangements. This is not considered necessary in Austria, and the work is handed over to a subordinate technical official or even to a layman. In this manner its preservation, which depends upon the permanent supervision of its architect or a qualified successor, is not only considerably jeopardised, but the most valuable buildings and monuments are sometimes exposed to accident from a technical and art point of view. There is also the risk that well-meant dispositions and arrangements do not come into action at all, in consequence of the absence of the necessary care, or are misapplied; and just this fact might be fully illustrated by the experiences gained at the burning of the Ringtheater. From what has been stated, it is self-evident that the sole security for carrying out in a reliable manner the reforms required in Austrian theatres consists in regulating the last-mentioned question. The best and well weighed advice acquires value only in its correct application. As long as there is a disinclination to confide technical matters to men specially trained for the purpose, and as long as the latter are only looked upon as the tools of other authorities, the question here treated, or any other technical matter, will never be satisfactorily solved.

The above report is dated Vienna, January 15, 1882, and is signed by Herren J. Dörfel, F. Fellner, H. von Ferstel, E. von Förster, Haberkorn, Th. von Hansen, Baron Hasenauer, H. Helmer, C. Pfaff, and Fr. Schmidt, all well-known names and prominent members of the Austrian Society of Engineers and Architects. It was read at the meeting of that society on January 21, and unanimously adopted.

Mr. Thomas Chatfeild Clarke, F.R.I.B.A., has received a unanimous invitation from the Liberal Association of Poole to be a candidate at the next election.

COFFEE HALLS.

It is interesting to the student of history to remark, as a phase of the present times, how many men of note and position are throwing themselves with great energy and great talent into every scheme likely to promote the onward march of progress to ameliorate existing abuses and to urge the adoption of measures of sanitary reform. Among these men, whose name is legion, are members of both Houses,—scientific, literary, medical men,—who devote the scant leisure left them by all-absorbing duties to the furtherance and spread of their theories. The very names of the men on some of the committees are in themselves a guarantee that the project, be it what it may, is at least worthy of receiving a trial.

The immense importance of the *mens sana in corpore sano* is now such a received fact that the ever-increasing necessity of drawing the masses from the slough of despond,—the lower world of our great city,—lies in getting the body healthier by purer air, and food good and more plentiful because cheaper. The mind naturally takes a healthier tone, giving the poison its antidote by offering more intellectual pleasures, not taking their pleasures from them,—forcing them to look from the pictures they have been accustomed to gaze on to those these gentlemen hold up. It is by these means they are hoping to attain their end.

The "way is long," the wind of opposition, of ingratitude, of non-comprehension very difficult to struggle against; and it is not to be wondered at that many of these modern Jack-the-giant-killers, who began the fray with apparently indomitable courage, get weary of well-doing, disgusted, and eventually lay down their arms. One would have to be more than a Sisyphus in these modern times,—to have more than the strength of ten to always hold on to the end.

Two of the pet schemes most in vogue at this moment towards attaining the desired end are cheap coffee-restaurants for workmen and coffee music-halls. In the first they are supposed to be able to get a dinner for sixpence; in the latter, entertainments of all sorts in the music-hall style, but devoid of much of the rather dreary fun and ribaldry that too often characterises some of them; and in the case of the Royal Victoria Coffee-hall, to which I shall more particularly advert, as being the largest and, consequently most important, a concert of a very superior order is given once a week, where professionals of repute give their aid gratuitously, and amateurs of note also assist. It affords accommodation for 2,800 spectators, and who, on looking at the vast building packed from floor to ceiling on Thursday, the 9th, when the Prince and Princess of Wales, ever gracefully foremost and eager to further any good work, went down to judge for themselves, and to show, by the fact of their presence, their approval of a movement meant to be conducive to the further well-being of the people, could not but admit it was a gratifying sight to Miss Cons, the energetic and indefatigable secretary; to Lord Mount-Temple, Lord Brabazon, and other equally well-known members of the committee, to note the vast, the decorous, and, I will add, the appreciative audience their efforts had gathered within these walls, and whose hearty enthusiasm when they joined in the chorus of "God save the Queen," was a convincing proof loyalty was not, at all events, out of date in the New Cut.

What a different spectacle to that presented to our mind's eye by Charles Knight in his *Penny Magazine*, of 1846. "Look at our theatres! Look at the houses surrounding them! Have they not given a taint to the very districts they belong to. The Coburg Theatre, now called the Victoria, and the Surrey,—what are they? At Christmas time, at each of these minor theatres, may be seen such an appalling amount of loathsome vice and depravity as goes beyond Eugène Sue, and justifies the most astounding revelations of Smollett." Again, Mr. Walford tells us that the "Victoria Theatre was called the Coburg out of compliment to Prince Leopold of Saxe Coburg, the husband of Princess Charlotte; the first stone was laid by proxy in 1817, and the theatre opened on Whit Monday of the following May. It is situated at the corner of the New Cut, near what was called the Marsh Gate,—a turnpike; and probably the building of Waterloo Bridge,—commenced in 1811, completed six years later,—led to its erection. The foundations of the theatre are extensively composed of the stones of the old Savoy Palace in the Strand [near which the Art-Union of London is now located], and which were cleared away in order to form Lancaster-place. The builder of the structure was a clever French carpenter, called Cabanelle, who also invented a peculiar kind of roof, named after him."

In July, 1833, the title was changed to that of the Royal Victoria, in commemoration, it is said, of the young Princess Victoria and her mother, the Duchess of Kent, having visited it. There are also other interesting records connected with it. In 1830 Edmund Kean was paid 100*l.* for performing there for two nights. Booth, Cooke, Liston, Joe Grimaldi, Buckstone, Benjamin Webster, and G. V. Brooke, trod its boards. It numbered among its scene-painters Clarkson Stanfield; and in 1834 the great violinist, Paganini, performed here for one night,—his last appearance in this country.

Yet the Victoria enjoyed a doubtful reputation for some years; the audience, which had begun by being respectable, changed into a mob who sat in shirt-sleeves, cracked nuts, called the actors by their Christian names, and pelted them with orange-peel and apples, so that it was hardly safe for a respectable West-ender to enter. However, with the march of time and education, these things again altered, and in 1871 the audience of the New Cut assembled to bid farewell to their cherished home of melodrama, and though composed of the rougher classes, were as decorous as need be. The piece given was the same the theatre had opened with in 1811, "Trial by Battle; or, Heaven defend the Right"; and when Mr. Cave announced in a pathetic manner, "the curtain will drop for ever on the Victoria *Theatre*," and it fell, a mournful-voiced bare-armed young man in the front row of the gallery, summed up the case thus, "Ah! the poor old Wic! Pass the 'arf-and-'arf, 'Arry."

Well, it is the question of the "'arf-and-'arf" that has principally led to the establishment of these coffee-halls. Few want to deprive a hard-working artisan of his glass of ale at his dinner or supper, but they wish to prevent him spending the whole of his leisure time in a public-house,—a place he cannot take his wife or his daughters to, and where the temptation of an occasional sip ends too often in confirmed intemperance; and it is well known half the crimes committed come, not from the fair use, but the abuse of drink. Feeling that some places of amusement were needed where men could take their wives and children to enjoy an evening of harmless recreation, where they could get good coffee, good tea-cakes, and cheap sparkling beverages, these places, of which the Victoria seems to be chief, are being started. On ordinary nights the rate of admission is extremely moderate: on the concert nights it is dearer (a fact, I personally should imagine, was rather a mistake). There are some seats at higher prices for those in a higher grade of society,—a necessary thing, for it is a curious fact that places where only persons in their own position go are not popular with the people; they like to see the "swells."

If, then, the impetus given to the movement relaxes, or were eventually to fall through, it would not be the fault entirely of the class it is meant to benefit. There is not always a sufficiently hearty co-operation on the part of the general public. The danger to any new scheme lies so often in its being taken up with amiable enthusiasm that gradually gets cooler, or it is worked in too *dilettante* or amateurish a fashion, not on a sufficiently commercial basis; sometimes the failure is merely to be attributable to the want of sufficiency of funds to be able to weather and tide over that narrow isthmus that lies between non-success and success, and which almost always has to be traversed. The expenses are sometimes beyond the receipts, as in the Kensington Coffee Tavern, where the rental is 200*l.*, and the gas-bill, chiefly for cooking purposes, 160*l.* per annum; so that, it is feared, if they cannot find enough annual subscribers to pay the rent, they will have to close.

Then, I am told the numbers are not many of small drinkers or total abstainers who reside permanently in any neighbourhood, and the working classes are constantly migrating. Sometimes, too, the restaurants which began by giving excellent dinners at 6d. deteriorate, or the men are kept waiting,—an important point when they have only a given time for their meals. Then the public-houses are trying to vie and surpass in their coffee and tea their rivals. And as the making of good coffee is one

of the essential elements in the success of this undertaking, this is a point that should be closely looked after. In France coffee is so excellently made, and at such a cheap rate, that it is the universal and favourite beverage.

It is against all these adverse circumstances that the promoters of the present scheme will have to contend. A mere outsider, and in no way mixed up in the movement myself, it appears to me to hold the elements of so much good to thousands, as to deserve the good wishes and co-operation, not of one class in particular, but of the general public.

CARLEON.

ST. JEAN-DU-DOIGT.

THE church of St. Jean-du-Doigt, near St. Pol de Leon, in Brittany, is a singular and very interesting example of Breton architecture. It consists of a nave and aisles under one external roof, a well-proportioned tower with a graceful leaden spire, porch, ossuary, and sacristy.

We have frequently described what the Germans call "Hallenkirchen," or hall-churches; that is, churches covered externally by one roof, with their interiors arranged like a hall, divided into three parts or aisles by columns, and the church of St. Jean-du-Doigt may be taken as a Breton reading of the same class of building. There are, however, very marked divergences from the German treatment to be noticed in the Breton church, some of which spring from the fact that, whereas all the German churches of this class are vaulted, St. Jean-du-Doigt is covered with timber roofs; yet it is not quite clear that vaulting was not originally proposed. If the building was from the first intended to be covered by timber roofs, it is rather singular that the crown of the pier arches should be kept down to the level of the eaves of the roof, which leads to the necessity for a great height of bare wall over the crown of the arches, a very ugly feature, and one which quite destroys the idea of a hall-church. The Germans avoided this by keeping the vaulting all below the great tie-beams of the roof, and constructing the timber roof itself in one span, quite independent of the rest of the building. The English would have avoided it by covering the nave and aisles by three distinct external roofs, either high-pitched and gabled east and west, as at the Temple Church, or by a high-pitched gabled roof over the nave and lean-to roofs over the aisles.

Now each of these plans has its drawbacks. The Breton plan, as we have already pointed out, necessitates a dreary blank space of wall above the pier arches, which is certainly enough to condemn it; the defect of the German plan is its loss of the whole roof-space internally, and the vast quantity of timber required for the construction of the roof. Though, on the other hand, these enormous roofs have a very dignified and picturesque effect, nevertheless, there is certainly something unsatisfactory in finding a church some 60 ft. lower inside than it is outside.

The English ways of getting over the difficulty, although they avoid the faults of the German and Breton arrangements, are not without drawbacks of their own. The plan, for instance, adopted at the Temple Church necessitated two very long "valley gutters," which are apt to get choked up and leak, causing the ends of the rafters to rot, and the walls to get injured, and, where there is much snow, the objection to this treatment is a very serious one. The other English method, that of placing a high-pitched roof over the nave, and two nearly flat ones over the aisles, overcomes all these difficulties, but is exceeding ugly in effect. The old Dutch church in Austinfriars is an example of this treatment. The most sensible plan of covering in such a church is that pursued at Bristol Cathedral, where both nave and aisles have nearly flat roofs. It is, however, not free from faults: such a vast flat roof-space does not protect the building well from wet and snow.

The Church of St. Jean-du-Doigt possesses many features of interest. The east window, for instance, is a curious example of what, for want of a better name, we must call "Starform tracery." The large east window, with a rose or wheel introduced into the head, is quite a feature of Breton Gothic churches. Another local peculiarity is the wooden roof. It is the most elaborate one we know of in France; and is adorned with a great deal of rich carving, but anything less like the wooden roofs of our English churches could scarcely be conceived. Several of the altars in the church of St. Jean-du-Doigt are ancient. They are all of the same simple design, with the piscina cut into the side of the back part of the altar. One of these altars is shown in our view. There seems to be evidence that the church was intended, in the first instance, to have been much larger than it is at present; the great jambs of what was probably intended to be a chancel arch are shown in our illustration. The footstone of the building was laid in 1440, and an inscription on the porch records its consecration in 1513. We have, in a previous number, described the interesting gateway, fountain, charnel-house, mortuary chapel, and ossuary which adorn the churchyard of St. Jean-du-Doigt.

STONE CHURCH, KENT.

WE add to the illustrations of this most interesting Early English church, given in our last number, a plan of the building, and the transverse sections, as promised. An account of the church will be found on p. 173, *ante*.

COLTHURST.

THIS illustration represents the first sketch for some additions to Colthurst, prepared for Lord Justice, then Sir John, Holker. Colthurst is a few miles from Clitheroe, in Lancashire, but is on the Yorkshire side of the river Ribble.

In execution, during the year 1879, the plan indicated by the accompanying sketch was altered, the oriel window being placed at one side, instead of at the gable end of the billiard-room, which occupies the upper floor, and being faced by an "oriel fireplace," so to speak, on the opposite side. The house has been furnished with taste by Messrs. Gillow. The architect is Mr. Edward J. Tarver.

WESTGATE-ON-SEA.

BUILDING operations at Westgate-on-Sea within the last two years have been brisk. As many of our readers know, this agreeable watering-place received, some few years ago, a notoriety through the recommendation of a well-known physician, and it was laid out at great expense by the then owners of the estate, with sea promenades and wind-protected gardens. One peculiarity of it is that the houses fronting the sea have to be built as detached residences, no semi-detached houses or terraces being allowed. The result is that for picturesqueness of buildings, as apart from any natural beauty of foliage or undulation of soil, this little seaside resort is noticeable.

The building illustrated was erected for Mr. Frederick Davis,* of Apley-rise, Isle of Wight, and was planned with special reference to his comfort,—thus, a bed and dressing room, with bath-room and w.c., were placed on the ground floor, so that an invalid might be on a level with the reception-rooms, and not have to climb or descend stairs, and that a good view could be obtained of the sea and the promenade from the windows of the bedroom. A large covered verandah was also provided, with an octagonal projection, to be used as an external tea-room in summer time, in order that the occupiers might enjoy the sea breeze and be shaded from the sun at the same time.

The accommodation on the ground-floor consists of drawing-room, library, dining-room, serving-room, lavatory, and w.c., besides the special bedroom suite mentioned above.

The dining-room and library have folding-doors, so that they may be formed into one large dining-room at pleasure,—33 ft. long,—when the house is full of visitors.

The lowest floor is about as much below the level of the garden as the ground floor is above it. The accommodation on this basement story consists of kitchen, scullery, pantry, larder, butler's room, servants' hall, and the usual domestic conveniences. There are five bedrooms and a bath-room on the first floor, and four bedrooms, a housemaid's closet and a large box-room on the attic floor. From the principal bedroom on the first floor there is a way on to the covered verandah, which is seen at the upper level in our view.

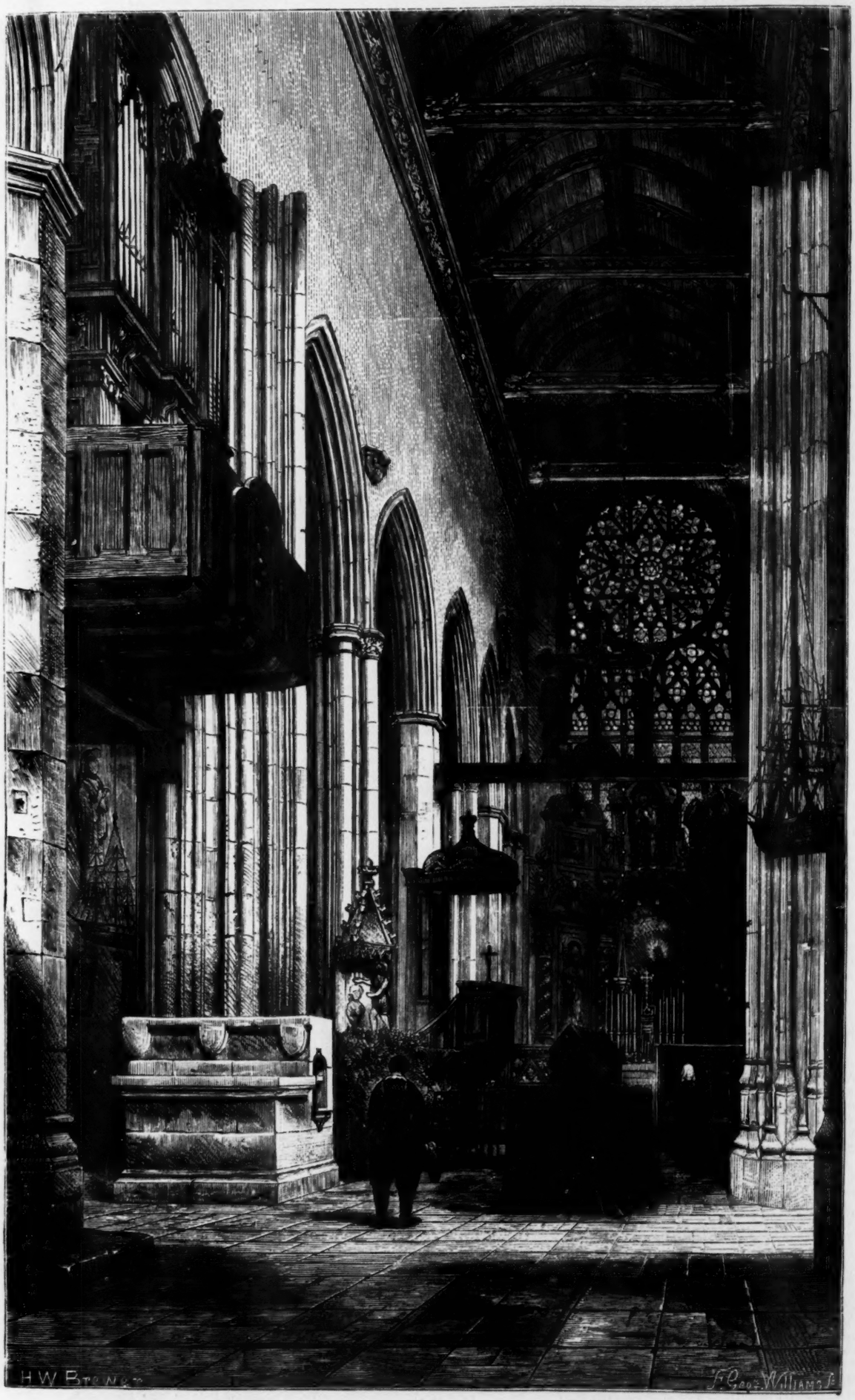
The house was built by Mr. J. G. Naylar, of Rochester, from the drawings and under the superintendence of Mr. Lewis Solomon, of Gray's Inn-square, and no clerk of works was employed. The building, with inclosure walls, &c., cost a little under 2,800*l*. The external walls are hollow, bonded with iron ties, and rest on a concrete foundation above the chalk, which is disclosed immediately under the top soil. The tiles and terminals were supplied by the Aylesford Pottery Company; the stoves and ranges by the Falkirk iron foundry; the iron railing, stairs, and vane by Cottams; and the mantelpieces by Tagnon. Gas and water are supplied to the house by the local companies, and a rain-water tank is provided for water for domestic purposes. Hot and cold water are laid on throughout the house. As yet there is no main drainage at Westgate-on-Sea, so the house is drained into a cesspool sunk over 30 ft. deep into the chalk.

* Although this gentleman bears the same name as Mr. Edmund Davis, who formerly owned most of Westgate-on-Sea, and who advertised it so extensively, we are informed he is no relation to the latter.

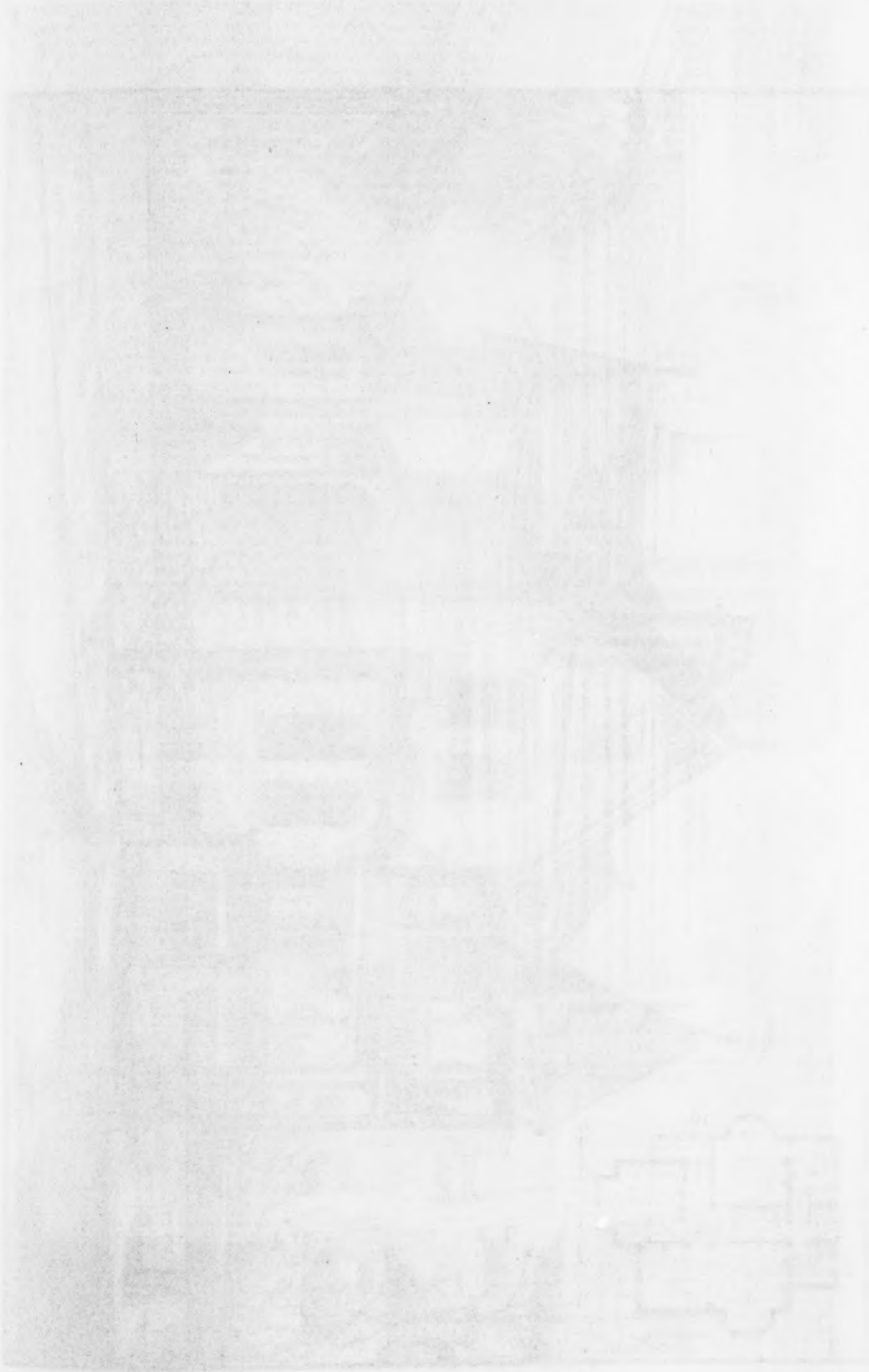
THE MUTILATION OF STATUES, AND THE MEANS OF DETERRING ITS REPETITION.

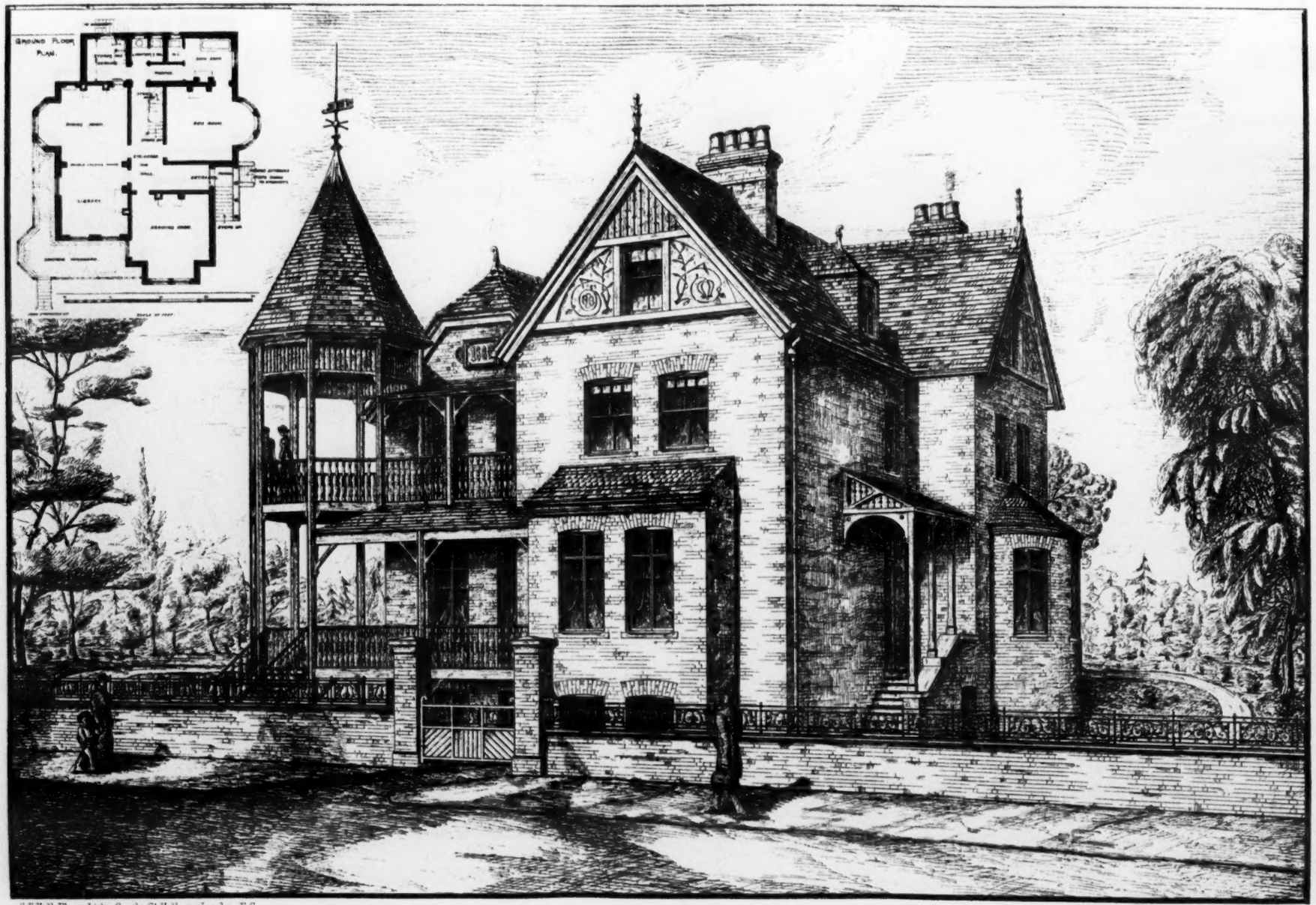
WITHOUT allowing the instinctive feeling of reverence either for public monuments or for any specimen of the art of that date which fetches so high a price in articles of the fabric of the silversmith, to blind us to the fact that Bird's statue of Queen Anne to the west of the cathedral church of St. Paul's was not in itself one of the finest ornaments of the metropolis, we cannot omit to express detestation of the offence which has destroyed what appearance of regal dignity had been left by the weather. We cannot but feel that many of those who have been concerned in the erection of some recent public monuments in London ought seriously to debate with their own consciences how far they may not be accessory to a public and growing sense of disgust, which may take form in some lamentable outbreak. We have ourselves known excellent men, and good artists, who have expressed a very ardent desire to fill their pockets with stones, for the demolition of some of the stained-glass windows which disfigure noble buildings not 100 miles from the scene of the recent outrage.

The attack on Queen Anne's effigy, we are told, is the work of a madman. Truly it may be so. But we have to point to a great danger which is menacing the world. Men are getting too much disposed to put forward the plea of "madness" as the excuse for crime. Whether it be the disfigurement of a monument, or the destruction of human life itself, vicious or foolish people raise the cry, "The man's mad; take no notice!" Now, if these pseudo-philanthropists have their way, we may expect a very full catalogue of outrages, all to be excused on this plea. A man is so passionate, so idle, so incurably vicious, that he *must* be mad. Therefore,—therefore what? Therefore, we say, make the law which punishes wanton outrage so plain, so certain, and so severe, that no one who is trusted to go at large can doubt what will betide him if he allows his tendency to madness to urge him into crime. The present cry tends, as far as it has any effect, to diminish the self-control of the eccentric or the violent. If a man suffer under that heaviest of all calamities, the total loss of reason, no doubt he must be cared for and treated as if he were a bodily, instead of a mental, paralytic. But if he be sufficiently removed from either idiocy or frenzy to be allowed to go about at large, if he understands that fire burns, that water drowns, or that food comforts, so can he understand that law punishes malignant offences. If he can see the sequence between cause and effect in other respects, and guide his conduct by that perception, so will he guide it if the latter sequence is indubitable. Not alone then for the public safety, but for the protection of those unfortunates who vibrate on the frontier of mental incapacity or of self-indulging passion, Humanity demands swift, certain, and sure punishment for wanton mischief. It is bad enough when, in the heat of passion, one disputant strikes another a fatal blow. There are moments when even the ordinarily well-conducted lose self-control. But even at these moments the fear of a sharp penalty,—and most certainly if it take the form of the infliction of personal bodily pain, comes in wonderfully to the aid of the reason. In cases where there is not the excuse of passion, the influence of this check is even more certain and more desirable. "He knows when he is whipped," was once adduced as a proof of the intelligence of a very small child. If this test were applied, with drum-head rapidity, either to the defacer of monuments or to the unprovoked assailant of human beings, the first vigorous use of the cat would probably be, for a long time, also the last.



CHURCH OF ST. JEAN-DU-DOIGT, BRITTANY.





C.F.Kell, Photo-Litho, Castle St Holborn, London, E.C.

TURRET HOUSE, WESTGATE-ON-SEA, THANET.—MR. LEWIS SOLOMON, ARCHITECT.

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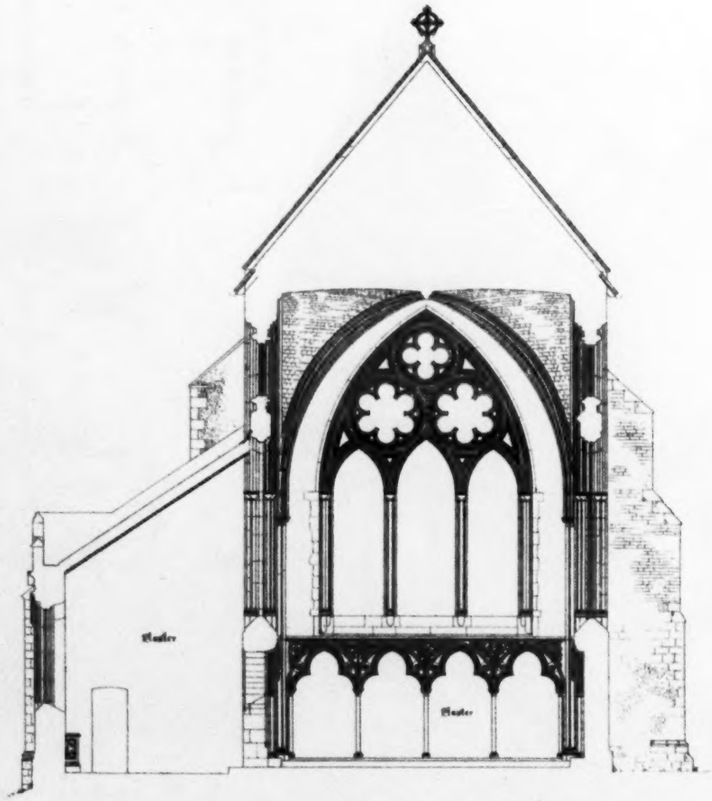
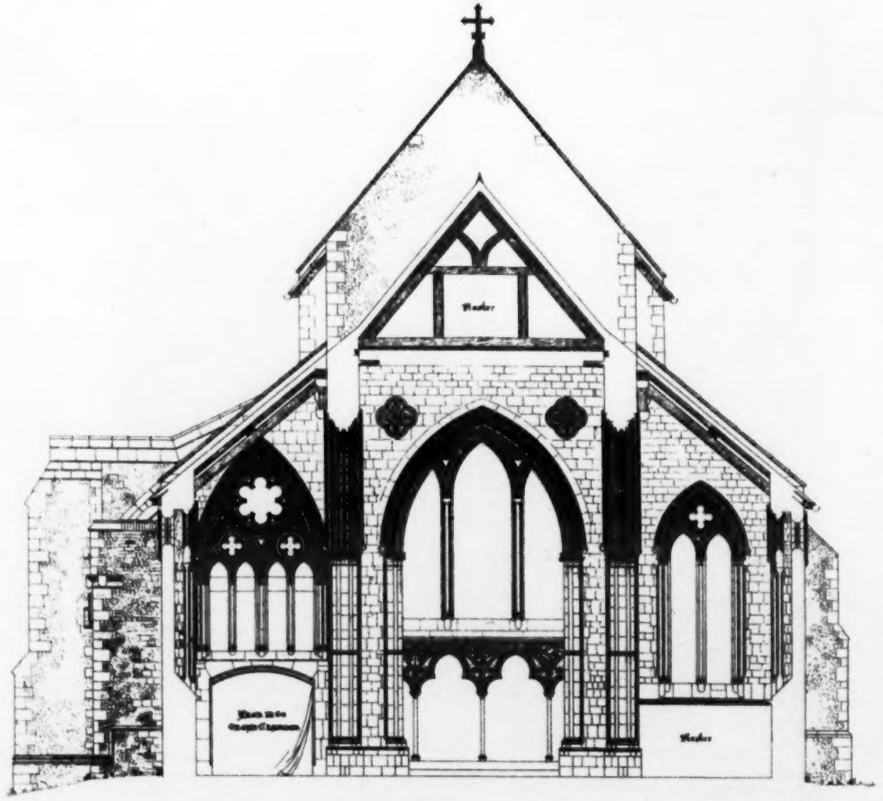
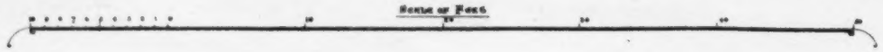
CHURCH OF S. MARY STONE Kent



TRANSVERSE SECTION THRO' CHANCEL LOOKING EAST



TRANSVERSE SECTION THRO' NAVE AND AISLE LOOKING EAST



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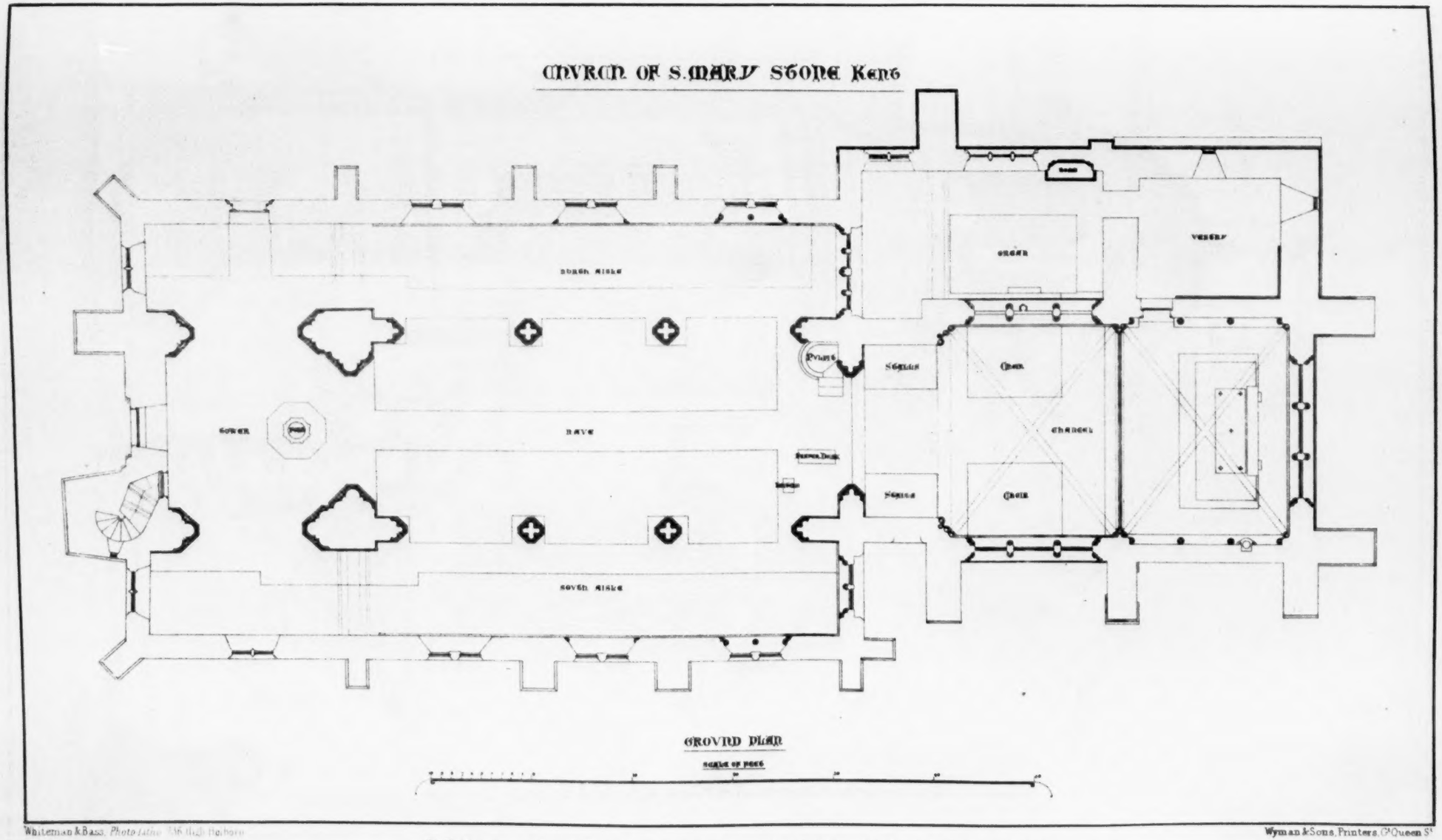

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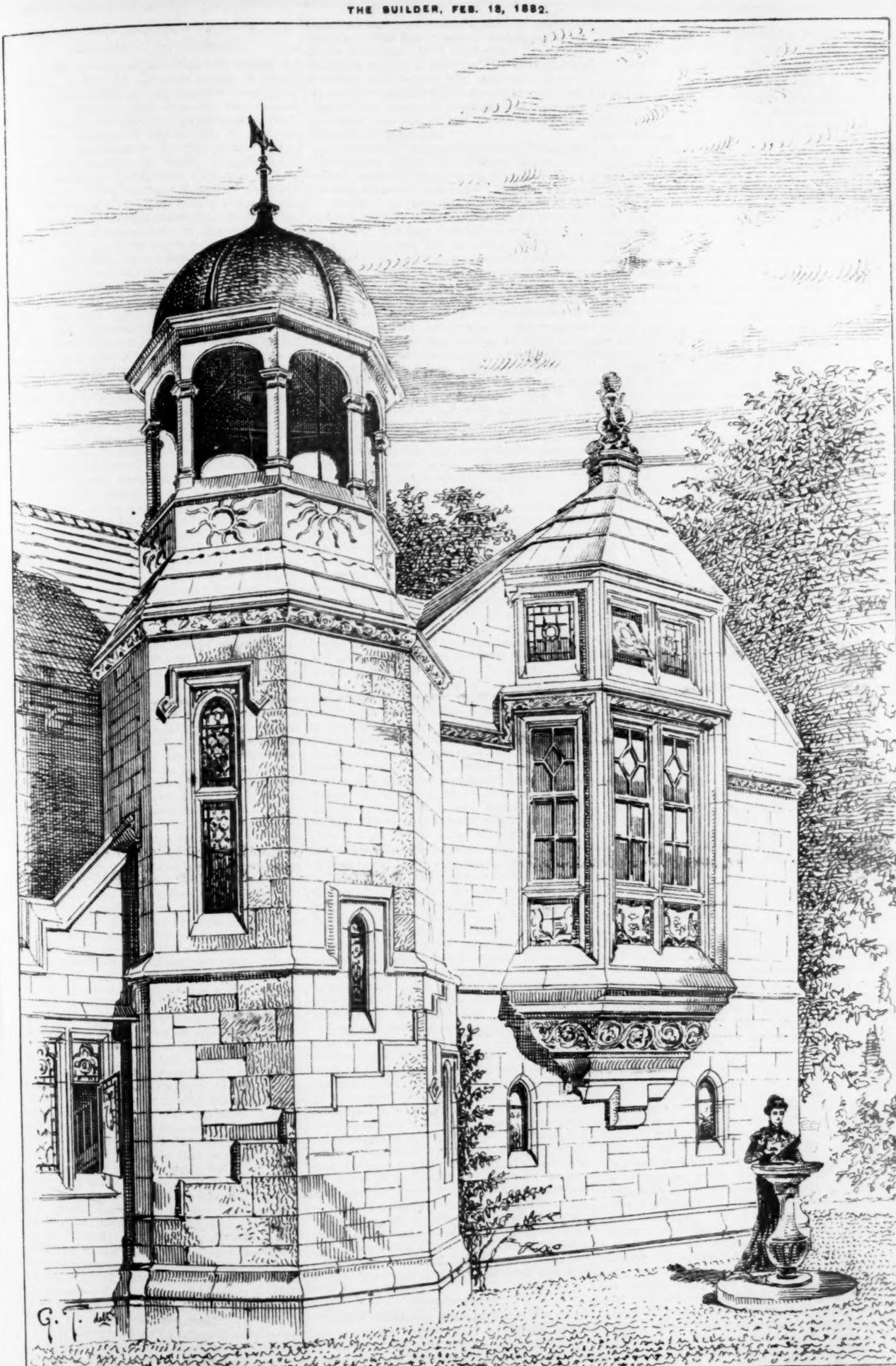
ROYAL ACADEMY SILVER MEDAL AWARDED 1881.

To W. B. BASSETT-SMITH.



C. F. Keil, Photo-Litho

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A CORNER OF COLTHURST, THE SEAT OF LORD JUSTICE HOLKER.—MR. EDWARD J. TARVER, ARCHITECT.

SKILLED AND AMATEUR LABOUR AND THE ROYAL COMMISSION.

IN the correspondence that our article on certain normal and informal aspects of skilled labour has elicited, and the remarks it has given rise to through other channels, the writers have nearly all wandered somewhat astray from the true bearings of the subject or subjects. Personal experience is to some extent useful, but no one workshop or locality is sufficient in its examples to be accepted as a safe basis to build upon. The personal contact of outsiders with workmen, of outsiders who have no practical or technical knowledge themselves of the workshop ways of operatives, or the methods of labour that generally obtain in the practice of their handicraft, cannot count for very much, though this does not import, at the same time, that these outsiders are not intelligent and observant men who are interested in the subject that calls forth their remarks. We have often during the last twenty years spoken of the value of technical or industrial education for the elevation of the workman and the character of his workmanship, and long too, before the least echo of the question was heard from out the circle of the City Guilds. Indeed, more than a decade since, we roughly mapped a scheme or plan of action which we commended to the attention of those said guilds, and looking back now through the interval, and in the presence of a Royal Commission on Technical Education, we can with some satisfaction claim to have contributed to the visible results by our persistent advocacy. Unhesitatingly, however, we must express our opinion again that the decline of the apprenticeship system in this country is a matter to be deplored, and even now, when trades are being split up and subdivided, a system of regular apprenticeship is a thing to be urgently recommended, even if some modifications are found to be necessary in respect to time and conditions of servitude. Through the immemorial system of apprenticeship a normal or regular training-school was provided, in a manner, for the young workman. Being under a master, who was bound to teach him his trade, and found it to his interest to do so, the apprentice steadily progressed in the knowledge of his trade, particularly as he was always more or less in contact with a number of journeymen skilled hands, employed in the workshop. Technical education, in itself, is commendable, even if it only results in imparting scientific knowledge, but, to be serviceable to our future race of workmen, proper means and methods must be provided or arranged for the young workmen to apply it. Our elementary schools of the present time are imparting to pupils useful and practical knowledge, and as time advances they will probably be rendered more serviceable with a view to the future vocations of our youth, for boys' tastes and leanings are generally ascertained or visible before they leave school. We cannot attempt to anticipate what the recommendation of the Royal Commission may be, and whether, in their view of the present state of the apprenticeship system in England, they will be prepared to advise the formation of workshop schools, or training-classes in connexion with our large industrial handicraft and manufacturing firms and establishments. If a system or systems of industrial education that have obtained for a time, to some extent in certain cities and towns on the Continent have been found to work well in the interest of skilled labour, there can be no serious objection urged in this country to their introduction, and to giving the best of them a fair trial. Whilst most unexceptionable work is still executed in many skilled trades and industries in Great Britain, the fact is patent at the same time that we have large bodies of workmen in our midst who are not competent hands, and that it was next to impossible they could be such from the nature of the training they received, or, rather, from the absence of any regular training or instruction save what they picked up in the most hurried and haphazard way, being amenable to no proper head, rule, or system, and, unfortunately, feeling when too late the penalties of their want of training in their want of work or employment, save of an uncertain and unremunerative kind.

Verily, labour and skilled labour in all branches are undergoing rapid change, and their aspects of late years, which we have on former occasions alluded to, are disquieting. In handicraft, any more than in art, no one who is interested in the industries of his country can feel anything but regret at the growth and spread of practices tending to their injury, and to the demoralisation of the workmen. Of a verity, no; for, unless we give a dignity to handicraft by elevating the workman and making him take an interest in his work through its skilful execution, which will alike reflect credit on himself, employer, and his country, we cannot feel pleased at the condition of our industries.

A wide line of demarcation must always subsist between skilled and efficient labour,—the trained labour of competent workshop hands,—and that of amateur workmen. No small amount of the labour at present in the market is of the amateur kind, in so far as it is not the outcome of regular workshop learning or training. An amateur workman, like an amateur artist, who is outside the ranks, may possess a respectable amount of ability or skill in a particular line, but he will be found generally a workman without system, a "slow coach," an uncertain hand that cannot be yoked in companionship or relied upon with advantage. The amateur operative, pure and simple, does not often come into contact with the regular workman in the ranks of skilled labour, although the work of the former has an indirect influence in reducing the calls upon that of the latter. Men in all ages have "picked up," so to speak, trades or callings, and some of these persevering workers have succeeded in life, and others in future may succeed in a similar way, but arts or trades have never been, and never will be, sustained, advanced, and perpetuated in this manner. The amateur has a taste or liking for his work, whatever art or trade it belongs to, but the half-learned, badly trained, and incompetent workman dislikes his trade and work, because his handicraft, in execution, shames him in the face of his fellow-workmen and employer. Amateur labour in the building branches in domestic households has been always somewhat popular, particularly with the lady occupants of our dwellings. Among the lower middle classes and those under, the head of the house comes in for praise if he can handle in a rough way a few joiners' tools, and do a bit of general repairing, plain painting, &c. To put up a bookshelf, to mend an article of furniture by the aid of glue and a screw, to do a little paling or trellis work in the garden, to re-putty the glass in the conservatory, and give that structure a yearly daub of paint, or to put up window-curtain rollers, and stick on a door-bolt or sash-fastener,—is to achieve wonders in a household, and to earn the appellation from wife and friends of being "a very handy gentleman." The great majority of our households are not blessed with having a handy man in the person of the head of the house or husband. It is marvellous, indeed, that there are such a number of men in our midst who are unable to drive a nail straight, or even to hit it steadily upon the head with a hammer, without hitting a more sensitive nail and mangling the tip that sustains it. There are many housewives in humble households a great deal more handy in using the hammer, pincers, screw-driver, and gimlet, and even the saw, than their husbands. In hanging pictures, laying down carpets, putting up curtains, and doing a little upholstery work, women in a number of households will be found in advance of their husbands.

Such bad building and repairing work now obtains among a certain class of jobbing builders, and also in the work belonging to other trades, that householders with small means venture on bits of patching and inside repairing on their own account if there be a "handy man" in the family. The moral to be derived from all we have written is obvious enough. Good training is necessary to produce good workmen, and the sustainment of a good class of skilled workmen will tend to good building and other work. As many of our workmen eventually become employers of labour, it is natural to expect that as they were skilled workmen themselves they will, as employers, endeavour to procure competent hands, and secure the reputation of turning out creditable work. With honest intentions guiding the conduct of their business, they will seldom fail to give satisfaction to all who may need their services.

Ladies' Sanitary Association.—The prizes and certificates adjudged to candidates by Dr. B. W. Richardson, in the second competitive examination on "Domestic Sanitation," will be presented by Mr. Samuel Morley, M.P., on this Saturday, February 18th, at four p.m., in the Hall of the Society of Arts.

THE NATIONAL INDUSTRIAL HOME FOR CRIPPLED BOYS, KENSINGTON.

VISIT OF THE ARCHITECTURAL ASSOCIATION.

ON Saturday afternoon last a number of the members of the Architectural Association paid a visit to the new buildings lately erected for the enlargement of the National Industrial Home for Crippled Boys, Wright's-lane, Kensington, where they were very kindly received and conducted over the premises by Mr. E. C. Robins, the architect, Mr. F. J. Bovis, the superintendent, and Mr. Woodley, the clerk of works. The institution, established some fifteen or sixteen years ago, has gradually grown in extent, and now has sixty inmates, which number will shortly be increased to one hundred. The object of the institution is to receive for three years (and to board, clothe, and educate) destitute, neglected, or ill-used crippled boys, not under twelve years of age nor over eighteen, and to teach them a trade. First temporarily located in Young-street, Kensington, the Home was after a time removed to Woolsthorpe House, in Wright's-lane. This house is so named after Woolsthorpe, in Lincolnshire, the birthplace of Sir Isaac Newton, and is known to have been his property. It is said that he resided here, but of that we believe there is no direct evidence. It is further sometimes said that in the garden behind the house grew the celebrated tree from which Newton saw the apple fall, but in most, if not all accounts of Newton's life, the apple-tree in question is stated to have grown in the garden of his home at Woolsthorpe. In the garden behind the institution at Kensington is still pointed out a very fine old mulberry tree, in connexion with which the following story is, warrantably or not, told. It is said that the great philosopher was one day sitting beneath this tree, meditating and smoking a pipe. By his side sat a lady who fancied that he was deeply in love with her. Presently he took her hand, and she was greatly agitated at the thought that a momentous proposal was about to be made to her; but the philosopher, in his abstraction, only took her hand because he wanted to use one of her fingers as a tobacco-pipe stopper! Woolsthorpe House and some old buildings adjoining formed the nucleus of the Home in its new quarters, and workshops, kitchen, scullery, and servants' apartments were first erected. As funds came in and were available for building purposes, other buildings, including a schoolroom, playroom, and dormitories, were added. Woolsthorpe House itself was thoroughly overhauled, and has been altered and added to from the cornice upwards. The old entrance-doorway, and an interesting old mantelpiece, have been preserved. The front of Woolsthorpe House, being of red brick, the façade of the main block of the new buildings is also in brick of the same colour. Behind Woolsthorpe House is the "Louise Hall," so called because H.R.H. the Princess Louise, Marchioness of Lorne, laid its memorial stone in 1877. This hall is used for lectures and entertainments, and is intended also for use as a dining-hall. The buildings, the erection of which has extended over several years, have cost in all nearly 17,000*l.*, Messrs. Lucas & Son and Messrs. Bywaters having been the builders. Roughly speaking, the premises form three sides of a long quadrangular playground, beyond which is the garden, and at the bottom of the latter is a small detached cottage, for use as an infirmary or hospital, for the isolation of any of the boys suffering from any contagious disease. This, it seems, has seldom been used. The sanitary arrangements throughout appear to be excellent. In the dormitories, Boyd's hygiastic warm-air grates are used, in conjunction with outlets for vitiated air, some of them being provided with Bunsen gas-burners to assist the extraction. Fresh external air is admitted cold by means of Tobin tubes, and warm air by means of the stoves before mentioned. The water-closets used are Pearson's twin-basin trapless closets, which were stated to have given satisfaction, notwithstanding the somewhat rough usage to which they have been subjected for some four or five years. All drains are trapped and disconnected, and laid in straight lines from manhole to manhole, so that all sections of the drainage can be readily inspected. The trough-closets or latrines and urinals are automatically flushed by means of Mr. Rogers Field's siphon-tanks, as made by Messrs. Bowes, Scott, & Read. The tanks contain from 50 to 100 gallons of water, and can be set to discharge

five or six or more times per day, according to the rate at which water is admitted into the tanks. The flush thus obtained is exceedingly effective. Mr. Robins stated that this was the first time he had adopted this arrangement, and he was very pleased with it. In Germany, whence he had lately returned, great attention was being paid at the present time to sanitary arrangements of this kind, and the Germans were running us very closely in all such matters. It was true that they got many of their ideas from English inventions, but they were continually improving upon and perfecting the appliances suggested or introduced in England.

Before leaving the premises, the visitors inspected the workshops, of which there are three, viz., one in which relief-stamping for stationery is carried on, together with copper-plate printing and lithography; one in which tailoring is taught; and thirdly, a carpenter's shop. Each workshop is under the control of a master workman, who instructs the boys in their work. A great deal of good work is turned out by the boys every year, the receipts for which (although the charges are very moderate) more than cover the expenses of teaching-staff, materials, &c. A fourth workshop is about to be introduced, for the teaching of the saddlery and harness-making trade.

The Home, of which the Earl of Shaftesbury is president, is an exceedingly deserving institution, and is largely dependent on voluntary subscriptions and donations. Those of our readers who may care to visit the institution in full work will be courteously received by the Superintendent, Mr. Bovis.

DISCOVERY OF AN ANCIENT STONE CIST AND STONE IMPLEMENTS IN ORKNEY.

MR. SMITH, farmer, Grind, on making a road from his house to the new Tankerness-road, Orkney, lately came upon a stone cist, containing the skeleton of a child. Information was brought to Mr. J. W. Cursiter, F.S.A., who, along with Mr. T. S. Peace, architect, visited the place a few days ago, and carefully examined it. The cist was 1 ft. 9 in. long by 12½ in. wide and 15 in. deep, constructed of rough slabs of grey slate, from 1½ in. to 2 in. thick, joined together by half-checking in their width, and covered by a heavy and rather water-worn slab, about 5 in. thick. A stratum of clay, about 8 in. thick, had been deposited above it, and peat had formed over all, to a thickness of about 4 in.

The thinness of the peat formation, after such a long period, is explainable from the fact that it was on the top of the mound, where the wind and rain would subject it more readily to denudation than on level ground. The cist lay lengthwise, about east by north and south by west, the head of the skeleton being towards the east, but the bones were very much decayed, and had crumbled to some extent on being exposed to the air. The skull was very well formed, and the remains of the jaws showed several undeveloped and some full-grown teeth. In addition to the bones of the skeleton, a small bone implement or ornament, about 2½ in. long, of the thickness of an ordinary lead-pencil, with a small notch cut around one end of it, was found. It was well made, and seemed as if had originally been polished. No other articles were found either in or about the cist. The cist itself was situated on the site of a mound, of about 50 ft. diameter, and 6 ft. to 7 ft. high, and it seems not unlikely that more than one interment had taken place in it, though as yet only the one grave has been met with. The bulk of the mound is formed of large quarried stones, which must have been conveyed to the spot, as no rock is known to exist there. It should be mentioned that the bottom of the cist did not consist of one slab, but was formed of a smoothly-set surface of small pebbles, over which clay had been deposited by filtration to the depth of nearly 1 in. The slabs forming the sides and ends of the cist, and also portions of the skull, were slightly encrusted with stalactic deposit.

On the estate of Saverock, about two miles from Kirkwall, Mr. Fergus, the proprietor, in walking in one of his stubble-fields last week, observed, half-embedded in the soil, a white stone celt in a fairly well-preserved state. This led to further examination, when, within a few feet, he picked up a perforated hammer-head of granite. A stone mortar and some rough stone hammers found in the same field, and also the half of a fine-grained polished granite axe or hammer, have since been obtained by local antiquaries.

NOTES AT THE SPORTSMAN'S EXHIBITION AT ISLINGTON.

THIS exhibition, opened on the 9th inst., closes this Saturday, the 18th. Although it contains much to interest many of our readers, there are not many exhibits which come altogether within our own special domain. The first thing that will strike the visitor is that the carriage shops and factories of Long Acre have been cleared and their contents sent to the Agricultural Hall. This department of the exhibition certainly seems to be overdone. Most of the exhibits in it are very good, but possess little or no novelty. Hart's patent "Thauma" carriage, a reversible Stanhope phaëton and wagonette, has the front seat so arranged as to open across the centre, the two halves of the seat concurrently sliding outwards, so as to form a passage whereby a person in the back part of the vehicle can pass to the front seat without either dismounting and re-ascending, or climbing over the back of the seat. This is obviously a very convenient arrangement, especially for ladies. Messrs. Marston & Co.'s "Imperial Brougham Hansoms," shown in two forms, embody some recent improvements which are likely to be appreciated. While speaking of carriages, we must not omit to direct special attention to the hospital ambulance exhibited by the patentee, Mr. J. U. Burt, carriage-builder, Swinton-street, Gray's Inn-road. The one exhibited has been purchased by Mr. J. H. Crossman for presentation to the London Hospital; and we understand that one is in use at the Gas Light and Coke Company's Works at Beckton, where from 2,000 to 3,000 men are employed. The ambulance is mounted on four wheels, and is intended to be drawn by horse-power. It is covered with waterproofed canvas on the top and sides, portions of that at the sides being removable for the admission of fresh air when circumstances render it necessary or desirable. The litter slides in and out from the back on rollers, and by the side of it is a seat for an attendant. On an emergency, the ambulance can be made available for the conveyance of two or four persons. The vehicle, as a whole, is light, compact, well arranged, and mounted on easy springs,—not likely to be found too easy, however, by suffering patients *in transitu*. An effort is now being made to establish a properly-organised hospital and accident ambulance service for London, and a paper on the subject was read on the 30th ult. before the Medical Society of London by Dr. Benjamin Howard, F.R.C.S.E. We notice the subject at this length, because, unfortunately, accidents are continually occurring to workmen engaged in the erection of buildings, and it is in many cases of vital importance that the injured should be promptly and easily conveyed to a hospital. Before leaving the subject of carriages, a word is due to the remarkably large collection of bicycles and tricycles, which occupies the whole of the spacious galleries. Some of these machines are models of excellence, both in finish and adaptability to the end in view. No one can witness this large display, made by many exhibitors, without becoming aware of the importance and extent of this comparatively new manufacture, the principal seat of which appears to be Coventry. To our older readers, who remember when, as in the case of the movement for cheapening gas, and that for bringing about the wearing of the moustache and beard, the *Builder* worked single-handed to make evident the advantages that would result from such a mode of locomotion, it will appear the more surprising.

Messrs. Croggon & Co. exhibit a very convenient portable shooting-box of three rooms, externally of corrugated iron, but lined internally with match-boarding, a layer of inoderous felt being placed between the iron and the wood for the sake of ensuring greater warmth. As furnished by Messrs. Bartholomew & Co., it is a very comfortable little retreat. Mr. W. H. Lascelles, of Bunhill-row, also shows a very convenient portable building, wholly of wood. The sides are made of rough weather-boarding outside, and are lined inside with varnished match-boarding. The floor is boarded, and the roof boarded and covered with prepared roofing felt. These buildings are cheap and good of their kind, and have, we are told, been largely used as shelters for shepherds, gamekeepers, &c. Messrs. Boulton & Paul, of Norwich, have several good and useful things in the way of movable piggeries, fowls' houses, &c., and their composite dog-kennel and run is well worthy of attention by those who own dogs, and wish to keep them controlled without subjecting them to what has been called the "torture of the chain." Messrs. Soane, Smith, & Co. are exhibitors of some well-made china dinner and other services, but we have before now deprecated the taste which, as in the sets made for the Empress of Austria, has led to the representation on each piece of some very realistically-treated scene in the hunting-field. Messrs. Thurston & Co., of Catherine-street, Strand, are exhibitors of some well-made billiard-tables and billiard-room furniture and gas-fittings; and Messrs. Burroughes & Watts, of Soho-square, have also a very good display of the same kind of furniture, including their very useful "Cottage" billiard and dining table combined, interchangeable in one minute. Mr. Hindley, of Bourton, shows some combined vertical engines and boilers, and Messrs. Ihlee & Horne are exhibitors of Balmain's luminous paint. Messrs. Steven Bros. & Co., of Upper Thames-street, are the sole exhibitors of stable and cowhouse fittings, which (mentioned elsewhere in the present number), without being pretentious, are very good of their kind. Sportsmen know how to appreciate a good dinner, and therefore may be expected to take some interest in the admirable cooking-range which, with other stoves and miscellaneous articles, go to make up the remainder of this firm's exhibits, though these, the firm explain, would not have been sent by them but for a strike on the part of the moulders which prevented the preparation of "fittings." Foster's patent fire-extinguishing appliances are exhibited by the Chemical Fire-Engine Company. Danger from another element is guarded against by the "Kredemnon" patent life cape and other garments, the under sides of which have corks quilted-in so as to make them sufficiently buoyant to save the wearer from drowning.

The exhibition, taken as a whole, is a very interesting one.

A NEW TOWN-HALL FOR WIESBADEN.

THE chief burgomaster of the favourite Rhenish watering-place of Wiesbaden has just made known that a general competition is opened for designs for a new Rathhaus or Town-hall for that city. The programme of conditions, with plan of site, are to be obtained at the burgomaster's office, Marktstrasse No. 5, Wiesbaden. The building is not to cost more than 700,000 marks, or 35,000*l.* sterling. The site is stated to present some difficulties, and, moreover, the new Rathhaus will be near a new theatre, and is to unite with that edifice and with the adjacent Evangelical Church and Schloss in forming a harmonious group of buildings. The designs are to be sent in on before July 15th, 1882. There will be three prizes of 250*l.*, 150*l.*, and 100*l.* respectively. The judges will be the chief burgomaster, Herr Lanz, and two members of the city council of Wiesbaden, together with the architects, Professors Raschdorff and Otzen, of Berlin, Herr Weyer, of Cologne, and Herr Fach, of Wiesbaden.

CHANNEL TUNNEL.

ON Monday, the electric light was introduced into the Channel Tunnel borings at Shakspeare's Cliff, Dover. Altogether there are six lights in half a mile of boring, one light being placed towards the end of the heading to facilitate the operations at the drilling machine. Hitherto the tunnel has been lighted by lamps and candles only. The alteration in the number of working hours has resulted in a difference of an additional 4 ft. per day being cut. The average rate of boring has now been brought up to 28 ft. per day, and it is anticipated that the introduction of the electric light will make a still greater difference.

The Proposed New Parish Church at Hammersmith.—Samples of the stone proposed to be used in the construction of the new church are placed in the churchyard, and these the parishioners will have an opportunity of inspecting. The stone selected is red Mansfield, and is a very durable stone, although the colour is rather high. Tenders for building the new church will shortly be received.

GLASGOW INSTITUTE OF ARCHITECTS.

THE twelfth annual dinner in connexion with this Institute was held in the Grand Hotel, Sauchiehall-street. Mr. John Honeyman, F.S.I.B.A. and I.A., president, occupied the chair. The duties of croupier were discharged by Mr. James Sellars, jun., the vice-president. Among the gentlemen present were Messrs. Wm. Landless, treasurer of the Institute; Charles James MacLean, writer; Professor James Thomson, the College; John M'Lachlan, president of the Edinburgh Architectural Association; John Danskin, John Baird, George Bell, George Bell, jun., J. J. Burnet, H. K. Bromhead, John Gordon, John Hutchison, James B. Lamb, Paisley; Wm. Leiper, J. A. Morris, Ayr; John Murdoch, Ayr; John Mercer, Ayr; Alex. Petrie, Thomas Stout, writer; David Thomson, T. L. Watson, A. J. Williamson, &c. After the usual loyal and patriotic toasts,

The chairman proposed "Prosperity to the Glasgow Institute of Architects." In the course of an interesting speech, the chairman, after commenting on the Roman Villa at Brading, said,—But, gentlemen, now comes the upbraiding part of the homily. If you search the pages of the newspaper from one year's end to the other, and from one generation to another, you will find no record there of the building of a second Parthenon or Colosseum; and while the extraordinary development of physical science has produced results which, even fifty years ago, would have been pronounced beyond the range of possibility, it may perchance be some consolation to the perplexed spirit of our cultivated Roman to observe that, in architecture, at all events, we have done nothing so very extraordinary, and that even now we appreciate, and are attempting to imitate, the mosaics of his long-deserted *triclinium*. Yes, it is a curious reflection that although since that villa was consumed and forgotten we have advanced from the distaff to the spinning-jenny, from the road to the rail, from the runner to the telegraph, from the many-oared galley to the *Servia*, and from the glimmering oil-lamp to the electric light, in the world of architecture we can point to no corresponding progress, and so, if we leave the journal out of view, with all its news and all that its existence and its news imply, and think only of the architecture of the present and the architecture of 1,600 years ago, the vast and startling contrast disappears, or perhaps there is a humiliating consciousness that we have hardly held our own. Now, we need not be very much concerned to find that our art, so far as it is a fine art, has made no great strides since the days of the Roman occupation; because, while without doubt every great artist contributes to the development and illustration of true principles, the effect of his teaching may be inappreciable because not appreciated. His pupils may have eyes which see not, and ears which hear not, and unsusceptible minds; and so the excellent in art must ever be rather the outcome of the labour and insight of a gifted individual than of eclectic discrimination, or even a just interpretation of the accumulated teachings of centuries. But it is otherwise in mechanical science, and it is a matter of serious concern that we have hitherto to such a small extent availed ourselves of those new appliances and materials which the inventive genius of the age has now so freely placed within our reach. It would be interesting to pursue this subject further, and to try to find out what clogs our chariot-wheels,—why it is that, whereas the science of the Romans was displayed in the construction of their buildings more conspicuously than anywhere else, with us the very reverse holds true. But I dare say you will think that I have already done enough in conformity with our "custom," and I must therefore pause. Let me only, before resuming my seat, venture to suggest a clue which, I think, might be hopefully followed in unravelling this mystery. Is it not the case that there is among us undue devotion to forms archaic and traditionary conventionalities? Are we not too much wedded to forms and features of past periods of architecture, even when these have lost their original use and significance? For example, to bring this to the test, it would be an easy matter now-a-days, in such a building as Salisbury Cathedral, to carry the clearstories of the nave from end to end on iron girders without a single pier between the responds. How would you like that? Horrible! Words would fail you to utter your disgust. The idea, in short, is "too utter." Well, being a nineteenth-century architect, I agree with you, my brethren. I hate the thought of such a thing. But it is not a monstrously absurd idea, after all. No man, I presume, will say that the nave of St. Mary's Cathedral in Edinburgh, for instance, would not be immensely more useful if there was not a stone pillar in it. Why, then, waste half of the area by building huge stone pillars in it? Why? Because the exigencies of art require it; and we find such pillars were erected in the nave of Salisbury, or some other cathedral, in the thirteenth century. Gentlemen, is not that a monstrously absurd answer? What have we to do with the thirteenth century? I shall not say, "Perish the thirteenth century," even in jest, for no one is more profoundly sensible of what we owe to it. But its ways? Surely we have changed all that; and now our resources are not less strikingly different than our needs. And, as to the exigencies of art, is that not in such a connexion just another expression for the exigencies of inveterate habit or over-mastering fashion? The exigency of the present day seems to be the artistic treatment of entirely new arrangements and new modes of construction suited to the requirements of the age, and securing the greatest amount of convenience, comfort, and security which the means at our disposal can yield, untrammelled by the precedents of the past. It is this turning back that threatens to leave us like the pillar of salt,—unmoved and unimproved,—amid the whirl of events, while prejudice and fashion "make cowards of us all." But the brave as well as the feeble-hearted draw fresh courage from the consciousness that brethren in arms are near; so, gentlemen, "shoulder to shoulder" let us be true to our useful and mutually helpful association; and now let us drink together to its continued prosperity.

The toast was cordially responded to.

Mr. Sellars, the croupier, then gave "The Edinburgh Architectural Association, and other kindred Societies."

Mr. M'Lachlan replied.

Mr. John Baird proposed "The Strangers Present," to which Professor Thomson replied.

Other toasts followed.

NEW WATER WORKS.

IN the course of the address read at the opening meeting of the Society of Engineers Mr. Jabez Church, the president, said:—

There can, unfortunately, be no doubt that numberless people, more especially young children, die or have their health and happiness more or less injured by drinking polluted water. If in all towns, more especially large ones, good sanitary conditions were complied with, in having proper sewers and house drainage, with a wholesome water supply, much sickness and untimely death might be avoided. There is another aspect to this question which should not be overlooked. In most towns a waterworks, if designed by a competent engineer, should be a remunerative undertaking, and as no security can be better than water, inasmuch as nothing can supersede it, I venture to think the inhabitants of towns would do wisely to invest their savings at home in such sound property, thereby not only obtaining a fair return for the money, but at the same time securing the many blessings that a constant supply of wholesome water insures.

During the past year several important works in connexion with water supply have been commenced. On the 4th of June last, at Shustoke, the first sod was turned as the commencement of the construction of two large storage reservoirs in connexion with the supply of water to Birmingham. The amount of the contract for this work is 78,900*l.*, but with new pumping engines, buildings, &c., the total cost will be 125,000*l.* The engineer to the corporation, Mr. J. W. Gray, is the engineer for the work, and Messrs. Aird & Sons are the contractors.

In July last the Vyrnwy scheme of water supply for Liverpool was practically adopted by the Earl of Powis laying the first stone of the new waterworks at Vyrnwy. These important works, when completed, will be the largest of the kind in Europe, and will be able to supply a population of 2,300,000 people.

For many years the corporation of Liverpool have been considering what was best to be done for the water supply of their vast district, and many schemes have been laid before them, and the advice of some of our most eminent engineers has been taken upon the matter.

From the numerous schemes which engaged the attention of the corporation, two projects were ultimately selected, namely, those known as the Haweswater and the Vyrnwy schemes, when, after they had been subjected to the most careful consideration, and the merits of each had been weighed, the Vyrnwy scheme was selected by the corporation. The site of the future reservoir is a valley 780 ft. above the level of the sea. The lower end of this valley is some 300 yards wide, and here will be erected the retaining embankment. The depth of the excavation for this embankment will be 40 ft. below the present level of the ground, and the embankment will be carried to a further height of 84 ft., making the total height of this huge masonry wall 124 ft. from top to bottom. The width at the base is to be 100 ft., receding to 17 ft. at the top of the structure. From this lake the water will flow into Liverpool through an aqueduct sixty-seven miles in length, which will be formed partly by cast-iron pipes, and partly by tunnelling. To lessen the pressure of such a great head of water in the mains, there will be relieving reservoirs in the line of route. The cost of this work is estimated at 1,250,000*l.* The engineers are Mr. Thomas Hawksley and Mr. G. F. Deacon, of Liverpool.

In October last, the construction of new waterworks for Wakefield was commenced. These works will consist of a compensation reservoir to contain 240 million gallons; a storage reservoir to contain 200 million gallons; a storage reservoir to contain 300 million gallons; also a small service reservoir, about two miles from the town, to contain a few days' supply, and which will regulate the pressure in the town mains; a catch-water conduit; a line of iron pipes, 1 *ft.* 9 in. and 1 ft. 6 in. in diameter, from the reservoirs to the town; together with filter beds and other works. The engineer is Mr. E. Filliter, of Leeds. Many other works were commenced or completed during the last year, which time will not allow me to notice.

DANGEROUS STRUCTURES IN THE METROPOLIS.

THE Metropolitan Board of Works, at its meeting on the 10th inst., had before it a report from the Works and General Purposes Committee stating that they had considered the question of filling the vacancies in the Dangerous Structures branch of the Architect's Department, caused by the retirement of Mr. E. B. Hudson and Mr. W. Withers, referred to the Committee on the 27th ult. Mr. Hudson and Mr. Withers were employed temporarily, and had been so for some years, the former at 2*l.* 10*s.* a week, and the latter at 1*l.* 1*s.* a week. The Architect had suggested that, as there was no probability of any diminution of the work in this branch of his department, two young men should be appointed in the fourth class of officers; and the Committee, thinking this would be the best course, now recommended that the two vacancies be filled by the appointment of two clerks in the fourth class, at a commencing salary of 80*l.* a year; and that an advertisement be issued inviting applications for the two clerkships, and that the applications when received do stand referred to the Committee, with a view to the candidates who may appear most suitable being submitted to a competitive examination, and to the successful candidates being recommended to the Board for appointment. The report was adopted.

THROWING SNOW INTO SEWERS.

AT the meeting of the Metropolitan Board of Works on the 10th inst., the Works and General Purposes Committee presented a report stating that they had considered a report made by the Engineer, and referred to them on the 6th ult., submitting correspondence with the Vestry of St. Marylebone as to throwing snow direct into sewers in which there was an ample flow of water. The committee had conferred with the Solicitor, who advised that a communication be addressed to the Vestry to the following effect, viz., that the Board were advised that they had power to restrain and regulate the sending of snow, whether melted or unmelted, into the sewers; that such authority was vested in them by virtue of their general powers under the Metropolis Management Acts, and in particular by sections 138 and 205 of the Metropolis Local Management Act, 1855, and section 83 of the Metropolis Management Amendment Act, 1862;

It is evident, therefore, that however rapidly freestone is destroyed by the acid vapours of the London air, granite is safe. It is true that the obelisk shows some signs of decay, but this is entirely owing to its having been partially buried for generations in the damp saline earth of the shore at Alexandria. Long before the erection of this same obelisk by Osirtesen, at On, the City of the Sun (the Greek Heliopolis) more than 3,000 years ago, the Egyptians had made this important discovery, and, consequently, they built their everlasting temples and other monuments of granite upon limestone substructures, upon which the damp alkaline soil has had no destructive effect whatever.

H. T.

PAINTING AND SCULPTURE REGARDED AS ILLUSTRATORS.

Sir,—Judging from the misty discourses upon art with which we are from time to time fogged, *brain-tearing* would seem to be considered absolutely essential to art instruction. Art questions, though among the most difficult questions for solution, are much more susceptible of simple exposition and illustration than the *dilettanti* are apt to suppose. Amateur art expositors would appear to beat about for something extremely recondite in the way of theory before they venture to declaim and to make men stare; and as if they imagined that an artist, before setting to work on either a picture or a statue, sits wrapped in meditation, like a Kant, bent on evolving art out of his own inner consciousness; whereas, in nine cases out of ten, instead of thinking out some puzzle-brain question touching the relation of art to religion, before he sets his palette or piles up his clay, he has very early in his career to determine under what banner he will enlist as an illustrator; for Painting and Sculpture are the illustrators either of religion, philosophy, or of literature, or content themselves with the more servile occupation of copying the common incidents of life.

Art, without in the slightest degree attempting to become didactic, becomes ethical, by associating herself with religion, philosophy, and and poetry. She does not frame her own mood; she enlists, as we have said, under a banner. It is seldom, indeed, that she ever attempts to invent her own subjects, and when she does, it is, as a rule, with very indifferent success. She generally takes up those subjects for illustration with which the world is tolerably familiar, which have vividly impressed the public mind. It is in faithfully and rightly serving under one or other of the banners we have enumerated that Art takes her highest position in the empire of intellect. It is not by an eternal pictorial iteration and reiteration of the Ten Commandments and Watts's Hymns, as some persons would seem to suppose, that art becomes ethical. All that it is good for art to do, *rightly* done, is ethical in its tendency, and contributes, in some lesser or greater degree, to that general atmosphere of rectitude which is conducive to the intellectual health of the community. Persons stalk about discoursing upon art as if they were members of a Salvation Army and chanting pæans whose language is out of all proportion to the occasion, and which are outside the limits of common sense.

Other things being equal, it is in proportion to the intellect demanded for the conception and execution of a work of art that the work takes rank. Mind takes the first rank in art, as it does in the universe. All other qualities, drawing, colour, execution, &c., are as nothing when not utilised for the illustration of either great thoughts or of the beautiful. It is for this reason that the intellectual artist invariably enrols himself under the banner of religion; for the Scriptures contain the history of the aspirations of men's souls heavenwards, and of their struggles and sufferings for truth's sake,—they discourse upon the greatest themes which can stir humanity,—they furnish the most glorious subject-matter for art illustration that can possibly be conceived. Some artists who enlist under the banner of religion may lean to the austere manner, some to the redundant and surcharged, and a few to that better way which is determined by right reason and right feeling. This choice of mode is an ethical choice. The choice of the better way from the worse is in art, as in everything else, to all intents and purposes a moral choice. The souls of men were never elevated one tittle of a degree by all the acres of canvas of Rubens's rollicking art, wherein you may find all the machinery, technical skill, and material resources of art lavished in vain,—to no intellectual and profitable purpose. Those qualities which his works really do possess are, in the main, as vicious in one way as those exhibited in the ascetic art of an earlier period were in another. What is it that places the art of Michelangelo pre-eminent over that of Rubens? There is the same daring and fearless energy in both. Simply the fact that the art of the one is instinct with mental power, whilst that of the other revels, as it were, in mere brute force.

It is to the mental and ethical side that the art of the future will tend; all the resources that a great artist has at his command will be bent to this end. If art be not ethical in its best phases, how is it possible that it can in any degree minister to progress? Art becomes ethical without the slightest taint of pharisaical affectation, as conduct becomes moral by being perfectly proportioned to right ends. It is this unostentatious and unaffected correspondence in the progression of all things towards the best proportions, that they work together for the good. Whatever amount of misdirected thought, labour, knowledge, and skill, be lavished on works of art having other purposes than this, these will, as intellect marches triumphantly onward, be swept away as chaff before the wind.

W. C. T.

BELGIAN IRON.

Sir,—A short time since a statement was circulated in some of the professional journals, that Belgian iron imported into this country and largely used in buildings was exceedingly bad, especially as regards its tensile strength, and it was stated at the Iron and Steel Institute last year that some joists had been found which only equalled a tensile strength of six tons per square inch across the grain.

At the first convenience I had three joists taken indiscriminately from a considerable London stock, and sent to Mr. Kirkaldy for him to experiment upon just as he pleased, and I now send you copies of the certificates I have received.

Comment on my part is hardly needful, beyond that I may specially point to "facts, not opinions," as showing the ultimate mean tensile strength to be 21·7 tons per square inch, and the centre breaking-weight to agree very closely with the published tables of strength.

Archibald D. Dawnay,
Assoc. M. Inst. C.E.

ON SANITARY SUPERVISION.

When, after the somewhat recent deaths and narrow escapes of royal personages, we learn that at Bagshot Park it was found on investigation "that a large soil-pipe from a disused closet had been *simply* cut through by a careless workman, and its open end, leading directly into the main drain, was left immediately under the flooring close to the central hall, and thus a continuous stream of sewer gas was poured into the house,"—it would appear that the time-honoured dictum of Horace,—

> "Pallida mors æquo pulsat pede pauperum tabernas,
> Regumque turres,"—

is somewhat invalidated, and that death's *impartial* knock is more to be feared or welcomed, as the case may be, in those mansions (*regumque turres*) where simplicity and common sense in sanitary appliances have been neglected;—while in cottagers' homes (*pauperum tabernas*) immunity is somewhat secured by uncomplication. In the beautiful lines of Malherbe it is truly remarked,—

> "Le pauvre, en sa cabane, où le chaume le couvre,
> Est sujet à ses lois,
> Et la garde, que vielle aux barrières du Louvre,
> N'en défend pas nos rois,"—

the surest guardian from preventible disease is, however, the constant intelligent supervision of the skilled sanitarian; but "*quis custodiet ipsos custodes?*"

The following instance came under my notice, showing that all the arrangements, however much out of the way, will require constant intelligent supervision. In a house,—Al Sanitary Lloyd's,—repairs being required for the roof, the British workman, objecting to the smell from the soil-pipe ventilator, stopped it up with a rag; when the job was finished the removal of the impediment was forgotten. Not long after typhoid fever broke out in the family: this led to universal and complete investigation, and the discovery of the cause of the mischief. Perhaps the narrow escape of another member of the royal family will rouse us to face the ever-impending danger, and cause us to improve sanitary arrangements, which, among high or low, are an absolute disgrace to our so-called civilisation. In sanitary matters there is a vast deal of profession with a corresponding amount of insincerity; and,—as in the burning question of the suppression of drunkenness,—real sanitary progress will only be the result of the gradual education of all classes.

P. Hinckes Bird, F.R.C.S.

INVASION OF ANTS.

Sir,—Perhaps it may interest some of your readers to know how the "white ant" of India is doctored, for the same treatment might be as effectual upon his black brother. The following are extracts from my note-book:—

To destroy white ants:—50 lb. vegetable wax. When melted pour into it 2 oz. of nitric acid. Apply to ant holes and chinks.

Another method:—

Arsenic	2lb.	4oz.
Aloes	2 „	4 „
Chunam soap	2 „	13 „
Dhobees (washerman's) mud	2 „	8 „

Pound the arsenic and aloes; scrape the soap; mix all these with the dhobees mud; boil in a chattie (earthen pot) half full of water until it bubbles. Let it cool. When cold, fill the chatties up with cold water. Boil again for an hour. Apply the mixture as a wash.

Another method:—

Petroleum oil	10 gals.	or 3 gals.
Arsenic of commerce	4 lb.	or 1 lb.
Sugar of lead	4 „	or 1 „

Mix well; then syringe into holes and crevices. This mixture I commonly used to jail, barrack, and church walls, where the oil did not make an unsightly mark.

On flat roofs we strewed coarse matting well sprinkled with sugar, of which the ants are fond. When the matting got well full of ants, it was taken hurriedly away and burned. Whichever method was adopted, constant attention was necessary. If the "queen" ant could be found, her destruction would ensure the flight of all the tribe.

Sometimes we found that a large voracious black ant attacked, conquered, and drove away the white ants.

Small black ants were very troublesome in the larder, by getting to the food. The only way to prevent their depredations was to place the food upon a table whose legs stood in pots of water, for the ants could not get across the water.

When living in the Cape of Good Hope, my bath-room was invaded one night by an army of red ants. We discovered a large nest under the floor, which we deluged with boiling water, and then carted the remains away some distance from the house. There was no more trouble with them. I hope some of these hints may be serviceable.

Colonial Engineer.

WOOD PAVEMENT.

Sir,—In consequence of numerous inquiries regarding the system of wood pavement at Norwich, I venture to forward you a copy of my report as to the cost thereof.* I may state that the wood is laid simply on the old formation after it has been cleared to a depth of 5 in., upon a little sand. It is then well grouted and rammed, covered with a layer of fine shingle, which is gradually worn off. No concrete is used, no asphalte or bedding boards. We have some which has been down for three years, and stands as well as any other wood pavement I know of.

P. P. Marshall, City Engineer.

Stable Fittings.—Messrs. Steven Bros., of Upper Thames-street and Glasgow, have just issued, in a handy form, the "Stable Fitting" section of their full Trade Catalogue, the illustrations being reduced from the originals. It seems to be very complete, and is likely to be useful. Visitors to the Sportsman's Exhibition, now open at the Agricultural Hall, will find this firm's exhibit of these and other goods worthy their attention.

* It appears to range from 5s. 2d. to 6s. 5d. per yard.—Ed.

CHURCH RESTORATION.

MR. C. HODGSON FOWLER, F.S.A., of Durham, lectured before the members of the Leeds Architectural Society on "Church Restoration: What to Do, and What to Avoid." There was a large attendance, and the chair was occupied by Mr. J. B. Fraser, F.R.I.B.A., the president.

At the close of his address, Mr. Fowler said:—He knew it was impossible in this busy century of ours, with the multiplied calls of work on a man, that he could give as much time as he would often wish to a work; but let them give all they could, and they would find that their care and diligence were reflected in those working under them. He was aware that his audience might find many works of his where he had done things he now condemned, but that he expected was the experience of most men, and in work such as he had been describing they sometimes suffered from the well-meant efforts of those working under them. Speaking of the "Society for the Preservation of Ancient Monuments," he said that that society, if its views were taken merely from its prospectus, or from the expression of some of its more moderate members, had nothing objectionable about it; but they must judge its views as enunciated by its principal originators and supporters, and it would, he thought, be found impossible to agree with them. There was no doubt that restoration had often been carried much too far. No one who had any feeling for old work, or who had seen any number of our old churches, could deny it; but, because we knew and lamented it, that was no reason why restoration should cease. The society appeared to forget that churches were built for Divine worship, and simply treated them as monuments. He declined to do so, and looked upon them, firstly, as God's houses, and to be kept in order for His honour, and that could, he believed, be done quite consistently with keeping all their historical and architectural interest. The members seemed to have no care for churches as such, and, therefore, he, as a Churchman, could not belong to it. But though he could not belong to the society, he denied that he was any more destructive than its members. On the contrary, he felt that restoration such as he had advocated was truer preservation than the society's "let alone" theory, which must end in destruction.

MAGDALEN BRIDGE, OXFORD.

NOTWITHSTANDING the endeavours made, the preservation of Magdalen Bridge appears now to be hopeless. The following is a list of the tenders that have been delivered:—

T. Selby, Oxford	£16,469 0 0
T. Jones, Oxford	15,700 0 0
Kimberley, Banbury	15,461 0 0
Buxton, Herne-hill	14,809 14 10
Symm & Co., Oxford	14,487 0 0
Ottoway, Oxford	13,490 0 0
G. Jones, Oxford	13,132 0 0
Cook & Co., Battersea	11,443 0 0
Smith, Leamington	11,434 14 3
Hill, Gosport	11,200 0 0
J. Dover, Oxford	10,534 0 0
Pickall, Bromsgrove	9,810 17 2
G. Moss,* Liverpool	9,372 13 6

* Under consideration.

Quantities were supplied. Mr. W. H. White, surveyor to the Oxford Local Board, is the engineer to the bridge.

TOOLE'S THEATRE.

UNDER this title the rebuilt Folly, King William-street, was opened on Thursday last. We confine ourselves on the present occasion to saying that its architect, Mr. J. J. Thomson, A.R.I.B.A., has effected a surprising improvement in a singularly short space of time. The premises have been enlarged to the west and the north, and the general appearance of the interior is bright and effective. Messrs. D. G. Laing & Son have executed the building and the decorations (which include a new ceiling) from designs by the architect; Messrs. Battiscombe & Harris have provided the *carton pierre*, and Messrs. Strode the lighting. We cordially wish Mr. Toole the success he well deserves.

Electric Bells.—Messrs. Young & Buss, of Blenheim-street, New Bond-street, have just fitted a block of houses at South Kensington with their improved electric bells.

PORTSMOUTH DRAINAGE COMPETITION.

THE arbitrators, Sir Joseph Bazalgette and Mr. Bailey Denton, have selected three designs in this competition to be submitted to the Town Council. They are marked "Multum in Parvo," "M. M. I. C. E.," and "Delta," their respective authors being Mr. C. G. Adames, Borough Engineer, Portsmouth; Messrs. Quick & Son, Westminster; and Mr. Llewellyn Lloyd, C.E., London, formerly town surveyor, Bilston. The premium offered by the Corporation was 500 guineas.

GAS-ENGINES.

OTTO *v.* LINFORD.

THIS was an appeal (heard before the Master of the Rolls and Lords Justices Brett and Holker) from a decision of Vice-Chancellor Bacon dismissing, with costs, an application made by the plaintiff for an injunction to restrain an infringement of patent, on the ground that the patent was anticipated, and the subject-matter of it published to the world in the specification of another patentee. He also intimated an opinion not favourable to the plaintiff on various other points which were the subject of discussion on this appeal.

The Master of the Rolls, in concluding an elaborate and lucid judgment, said:—The infringement is made out, and the decree of the Vice-Chancellor will be reversed, and the plaintiff will have his injunction, with costs.

Lords Justices Brett and Holker concurred.

Judgment accordingly.

THE NEW SYSTEM OF COMPETITIONS.

SIR,—Referring to my letter of Dec. 17th, published in your journal, on the subject of competitions, I think it desirable, in the interests of the profession, to call attention to the actual working out of the new system.

For example, the conditions, which have already been partially published, for the final competition at Glasgow, require a complete set of plans, to a scale of ⅛-in. to a foot, of each floor and roof, viz.: six plans, four elevations, two or three sections, one perspective view, making in all thirteen or fourteen sheets of drawings, each of which (excepting the view) will measure at least 3 ft. square; and all to be finished in pen and ink, partly coloured. In addition to these, plans of warming, ventilation, and sanitary arrangements will either have to be incorporated on the above, or separate drawings made. Practically at least 60 to 70 superficial feet of paper will have to be covered with elaborate drawing, for each set, and this has to be multiplied by ten.

It follows, therefore, that the architects will be put to this great labour and expense, merely to enable the council and assessors to arrive at a decision, the bulk of the work being simply an enlargement of what has already been before them. No reasonable objection could be taken to two or three plans, one elevation, and sections sufficient to show clearly what is intended (though even for these one-tenth scale would be ample); but no satisfactory system of construction, sanitation, &c., can be devised until the exact requirements are known, and the working drawings got out for execution.

Instead of reducing the labour and cost to competitors, the new system bids fair materially to increase it, as the Institute's recommendation to make a sufficient payment to cover the cost has not been adopted. Half per cent. to the successful man, and one to two per cent. divided amongst the unsuccessful, have been mentioned as a fair remuneration, but in this case the amount which the Glasgow Council propose to divide is not much more than half per cent. distributed equally amongst the whole ten.

A clause of a very one-sided kind has been introduced, by which, if the four selected competitors fail to obtain a tender satisfactory to the Council, they may each be superseded, which will render their position uncertain and unsatisfactory. In ordinary cases two and a half or three per cent. on the builder's tender would be due at a corresponding stage in the work, but the Glasgow Council would not be liable for more than 150*l.* to each of the selected men in their turn. Of course it is hardly likely to come to this, but the conditions are hard.

Do you not think, sir, that these circumstances would amply justify a firm, united, and respectful protest to the authorities at Glasgow against such unreasonable requirements as they have, no doubt unintentionally and without realising the effect of their instructions, imposed upon the selected ten competitors?

OBSERVER.

COMPETITIONS! COMPETITIONS!

SIR,—It is quite possible that the decision of the judges, *in re* the Blackfriars Bridge competition, was perfectly fair and equitable. But after that flourish of trumpets which invited artists to the tilt, would it not have been more satisfactory to the public if the public had been admitted to be spectators of the joust? There appears to be almost invariably a falling through in these enterprises. Is it the fear which ignorance in art begets that makes art committees utterly undecided and un-English in dealing with matters of taste? I fear that this must be the case, and that art committees are conscious that they do not know how to set about their work.

There is now another competition advertised for designs for the sculptures to decorate St. George's Hall, Liverpool. The advertisement embodies the usual stock uncertainties. Artists are invited to compete, and to send in twenty-eight designs half size,—that is to say, from 2 ft. 2 in. to 2 ft. 9 in. square,—which, as you must very well know, sir, would require, to do them roughly, at least six months of the artist's time,—and yet without the slightest guarantee that the successful artist's work shall be carried out; or if carried out, that he himself shall execute them. Nay, there is not even the promise that the works premiated shall even remain the property of the artist. Now, any set of designs of the given size, and worthy of being premiated, would, at the most moderate computation, be worth five or six hundred pounds. But, I maintain, that the time given, as was the case in the Blackfriars Bridge affair, is totally inadequate to do justice to such a set of designs.

Art committees that resolve upon opening a competition should go more systematically to work. The first thing which ought to be decided is the subject or subjects to be designed. There might even be premiums offered for the best suggestions, after which a mixed committee of literary men and artists might determine this point. There would then be fair ground on which artists would be invited to compete. What can come of competitions concerning which neither committees nor artists have any definite notions? The subjects being decided, even if the competition were not an open one, there would be some guide to a selection of artists.

DRILL.

A SERIOUS CHARGE.

SIR,—I have been for upwards of forty years a working painter, and also a foreman of painters and decorators round Belgravia, and I am still in the employ of a very old firm not far from that neighbourhood, and being a thoroughly practical man I wish to expose the following most abominable system which is now practised by two or three firms I know of. If the practice is not altered I will publish several handbills at my own expense, and expose the parties that are acting in this manner.

The firm I am now working for have a contract a few miles from town, supposed to have three coats of good oil paint and a flat, and to be completed in a workmanlike manner. It has been washed and had but one coat and considered finished. What are the surveyors about? Are they blind? Labourers are now employed by several firms to do what painters only can do, and the employers are thus robbed.

I think this, sir, will open the eyes of the right parties if you will kindly insert it. I will send you shortly another account respecting a job I am now conducting. Unless I make one coat do for two, my employer is not satisfied.

T. M.

Value of Land at Chiswick.—Mr. Walter Hall, land agent and surveyor, of 28, Southampton-buildings, Chancery-lane, has sold by private contract, for the sum of 11,220*l.*, the whole of the Duke's Avenue Estate, advertised for sale by auction. The property, which is situated close to Bedford-park, comprises seven acres of freehold land, and covers the whole of one side of the avenue. The price realised is said to be the highest yet paid in that neighbourhood.

and that the Board, acting upon the advice of their Engineer, could not sanction the sending into the sewers snow, either melted or unmelted, except as to melted snow in such a limited manner, and subject to such conditions, as the Engineer might approve. The committee recommended that a letter be addressed to the Vestry of St. Marylebone accordingly. The report was approved.

STREET IMPROVEMENT AT MABLEDON-GATE, EUSTON-ROAD.

At the meeting of the Metropolitan Board of Works, on the 10th inst., the Works and General Purposes Committee reported that they had considered the memorial from the Vestry of St. Pancras, referred by the Board on the 7th of October last, on the subject of an improvement to be carried out by the Vestry in Mabledon-place, Euston-road. The memorialists drew attention to the removal of the gate at the entrance to Mabledon-place, and to the importance of the thoroughfare thus opened up between the northern and southern parts of London, and upon these grounds they asked for a liberal contribution towards the improvement which they contemplated, consisting of the removal of three houses at the Euston-road end of Mabledon-place, and the rounding-off of the east corner. The committee had viewed the locality, and had received a report from the Architect, in which he stated that the cost of the acquisition of the property would be 4,850*l.*, and that there would be a recoupment of 400*l.*, leaving a net amount of 4,450*l.* The Committee further learned that the Vestry proposed to widen the roadway on the eastern side of Burton-crescent to the extent of 10 ft., at a cost of 700*l.* The Committee were of opinion that the proposed improvement was a very desirable one, and they recommended that the Board do contribute one-half of the net cost of the same, such contribution not to exceed the sum of 2,575*l.*, and that it be paid to the Vestry on a certificate by the Architect of the Board on the completion of the work, and by the Accountant of the net cost of the same. These recommendations were adopted, and thus there is a fair prospect of the execution of a very desirable improvement, and one the desirability of which has been spoken of in our columns.

COMPRESSED AIR AS A MOTOR FOR TRAMWAY CARS.

The Works and General Purposes Committee of the Metropolitan Board of Works presented a report to the Board, at its meeting on the 10th inst., to the effect that, in pursuance of a reference to them by the Board on the 6th ult., they had considered a letter received from Messrs. Ashurst, Morris, & Co., applying for the Board's consent to the use of the "Mékarski Compressed Air Auto-mobile Cars" on the Caledonian-road line of the London Street Tramways Company, and enclosing report of Sir. F. Bramwell on the subject. The committee having given careful consideration to this matter, and conferred with the Engineer thereon, saw no objection to a trial of the cars on the road suggested for a period of three months, and they recommended in accordance with this view. The recommendation was adopted.

GERMAN CEMENT IN AUSTRALIA.

The German nation is developing its export trade in every possible way. Amongst other means towards that end there is an association which has for its object the diffusion of reliable information as to the wants of foreign countries and as to the progress which German goods are making in various foreign markets. Australia is receiving a full share of attention from this organisation, and a branch society seems to have been started in that part of the world where the Melbourne and Sydney Exhibitions have done much to familiarise Australians with the varied products of German industry.

From a communication made to the society by a German architect at Melbourne, it would seem that the value of Portland cement as a substitute for brick in building is receiving full recognition in the Australian colonies, where the scarcity of labour makes the application of a system requiring less-trained workmen than ordinary bricklaying or masonry a matter of practical utility. The cement spoken of is that of the Vorwohle Portland Cement Factory, near Holyminden, in Brunswick. The sanitary advantages of the system are dwelt upon with special reference to the fact that in damp seasons bricks absorb a large quantity of moisture, which is given off when they are in use, and cause the dampness on walls of which complaints are often made.

SITES CLEARED UNDER THE ARTISANS' DWELLINGS ACT.

IMPROVED INDUSTRIAL DWELLINGS COMPANY (LIMITED).

The report of this Company (of which Sir Sydney Waterlow is chairman), presented to the shareholders at their meeting on the 10th inst., states that during the half-year ending the 31st of December the sum of 689*l.* 7s. 5d. was paid on account of balances due on estates completed, and 13,506*l.* 7s. 11d. in respect of works in progress. The total expenditure on capital account is now 744,007*l.* 19s. The expenditure on works in progress has averaged 58,500*l.*, of which 42,700*l.* was only partly productive, and 15,800*l.* was wholly unproductive. The total income for the half-year amounted to 36,168*l.* 16s. 7d. The total expenditure was 21,470*l.* 11s. 2d., leaving a divisible profit of 14,698*l.* 5s. 5d., which, added to the balance, 249*l.* 17s. 9d., brought forward from last half-year, gives a total of 14,948*l.* 3s. 2d. available for dividend. The directors recommend the payment of the usual dividend at the rate of 5 per cent. per annum, free of income-tax, which will absorb 10,625*l.*, and that 4,000*l.* be added to the reserve fund for the equalisation of dividends, which will then amount to 47,000*l.*, and that 323*l.* 3s. 2d. remaining be carried forward to the next half-year's account.

The estates are maintained in thorough repair, and the sanitary condition of the dwellings is in all respects satisfactory. Waleran Buildings, in Old Kent-road, have been completed, and, with the exception of a few of the larger tenements, are fully occupied. Darwin Buildings, Walworth, brought into revenue in the previous half-year, are also fully let. Dover Buildings, Old Kent-road, are almost completed, and will be opened at the end of February. The directors have commenced the erection of 125 additional dwellings at the Bethnal-green estate, and propose to add eighteen more by raising some of the older buildings. These works will complete the estate, and will make the total number of families resident there 1,021, and the number of individuals about 4,600. The estate is nine acres in extent.

The directors have purchased at auction, from the Metropolitan Board of Works, a freehold plot of ground in Great Eastern-street, Finsbury,—a busy and densely-populated centre, where workmen's dwellings are greatly needed. This is one of the sites set apart under "The Metropolitan Streets Improvement Act, 1872," and the sum now paid by the company, calculating the rents previously offered at twenty-five years' purchase, is practically that which the directors offered the Metropolitan Board of Works in May, 1877, and on one or two subsequent occasions. Another site, situate in Tyssen-street, Bethnal-green, was also sold at auction, at a price which, worked out on the same basis, was only fractionally in excess of that tendered by the company in April, 1878; so that not only have the ratepayers lost in rental an amount equal to one-sixth of the value of the sites; but the poor, for whose accommodation the land was appropriated, have been for years debarred the opportunity of enjoying the benefits which were intended by Parliament. Of the ten sites set apart under the Act of 1872, seven are now disposed of, and with respect to one of these it may be noted that the Metropolitan Board of Works has let it on terms less favourable than those upon which the directors tendered in February, 1879, calculating the rent then offered on the basis, viz., twenty-five years' purchase, on which the ground-rents of some of the other sites had been sold by the Board. The Select Committee of the House of Commons, appointed to inquire into the causes that have prevented the reconstruction of dwellings for the labouring classes, under the Artisans' and Labourers' Dwellings Acts of 1875 and 1879, and the Metropolitan Streets Improvement Acts, 1872 and 1877, obtained most important evidence in connexion with these subjects, and as one result of the recommendations made in the interim report of the Committee, the sites recently sold at auction were offered for public competition without the onerous, stringent, and unjust covenants, which, on former occasions, had been insisted on, and to which the directors have from time to time objected.

West London School of Art.—Mr. G. A. Sala is to preside at the distribution of prizes to the students at the West London School of Art on Saturday, the 25th inst.

COFFEE TAVERN, KING'S LYNN.

The St. Ann's-street Coffee Tavern was opened by the Mayor, Mr. J. O. Smetham, on Friday in last week, supported by a large assemblage of the principal inhabitants of the town.

The new building has a frontage of 26 ft., with a depth of 90 ft.

The front is of red brick, in the "Queen Anne" style, and is relieved by cornices, string-courses, and other decorations of moulded bricks, procured from Messrs. Brown's, Broad-street-buildings, London; the facing bricks from Mr. Walker's yard at Massingham.

The ground floor contains the bar, 29 ft. by 20 ft., with manager's room, kitchen, &c., in the rear. On the first-floor are the reading and billiard rooms, with lavatories, retiring-rooms, &c.

The second or top floor contains a suite of bedrooms for the use of the masters of ships and others, thereby combining a Coffee Tavern and Sailors' Home.

The cost of the building, with fittings, will be over 2,000*l.* Messrs. Adams & Son, of King's Lynn, were the architects; and Mr. W. H. Brown was the builder.

THE NEW WING AT THE SUNDERLAND INFIRMARY.

The large and handsome new wing of the Sunderland Infirmary, which will enable the managing committee of the institution to provide accommodation for forty-six additional patients, is now approaching completion, and will, it is anticipated, be ready for occupation during the coming spring. It will be named the Backhouse Memorial Wing, in compliment to the late Mr. Edwin Backhouse, a philanthropist whose benefactions were not confined to the Infirmary.

The new building, the site of which is at the corner of Durham-road and Elwin-terrace, is in close proximity to the main block, and, indeed, has communication with it. The style of architecture adopted is a free adaptation of the Geometrical Gothic, the material used being best Sherburn red bricks, with stone dressings from Camphill Quarry. The dimensions are: length, opposite Elwin-terrace, 184 ft., and width in Durham-road, 50 ft. At each angle of the building there are two small towers, and between a balcony, to allow of the convalescents enjoying the fresh air. The main centre block is three stories in height, and the ward blocks on either side three stories. Over the centre block is a large louvre or flèche for ventilation, and projecting in front of the same block is the operating-room.

Entering the building from the existing doorway of the infirmary, and passing along the corridor, the central hall of the new wing is reached, which is lofty and well lighted. Here will be found a central granite column, with arches springing from it, and forming an arcading, which may be regarded as rather a novel feature.

On the right side of this large and spacious hall are the main stairs, and on the left a corridor for reaching the special wards. Passing along the corridor the museum is arrived at, and then three wards for the treatment of special cases, containing two beds each. The dimensions of these wards are 19 ft. by 16 ft., and contain about 2,000 cubic feet per patient in each ward. At the far end of the corridor is the annex for the bath on the west side, and the annex for the lavatory and closets on the east side, these annexes being cut off from the main building by a cross ventilated passage. Returning to the central hall, a corridor in front of the visitor leads to the operating-room, which is 27 ft. by 19 ft., and is lighted up by a skylight of novel construction, which diffuses the light equally over the apartment. At the east end of the room there is also a three-lighted window. The lavatories and sink are placed in arched coves built in the wall of the room, and in connexion therewith is a waiting-room for the reception of accidents. Returning to the hall again, and proceeding south, the first children's ward is reached, this being fitted with twelve beds, and allowing of 1,650 cubic feet per patient. At the south end of this ward is the bath-room, lavatory, &c., with separate annexes, and constructed on the same principle as those already described. The dimensions of the children's ward are 25 ft. by 54 ft., and 14 ft.

in height, as is the case in this latter respect with all the rooms on the ground floor. There is, also, in connexion with the children's ward a kitchen 12 ft. by 13 ft. Want of space prevents further description; but we may add that the walls and ceiling of the operating-room are finished with polished Parian cement, which makes a perfectly non-absorbent surface, while, as an additional safeguard, these walls and ceiling will be coated with patent silicate paints, rendering the surface of a glassy character. All the angles of the walls and ceilings, moreover, will be slightly rounded to prevent the lodgment of dust. The architect is Mr. John Eltringham, of John-street, Sunderland; and the various contractors are, — masonry and stonework, Messrs. Hirst & Sons; joinery, Messrs. D. & J. Ranken; plumbing work, Mr. J. B. Wilkinson; slating, Mr. Preston; and painting, Mr. Kirkup, all of Sunderland. The parquetry will be supplied by Mr. Ebner, of London.

THE BOARD OF WORKS AND NEW STREETS.

AT Worship-street, Charles Roberts, builder, was summoned by the Metropolitan Board of Works for not making a street called Tyson-street, Hackney, 20 ft. wide (footway only) contrary to the 25 and 26 Vict. c. 102, s. 98, and By-laws.

The summons was first heard on the 11th ult., when Mr. Bushby stated his intention to convict the defendant, but adjourned the summons for a month to enable the defendant to comply with the Board's requirements. At the adjourned hearing, Mr. Burton, solicitor for the Board, stated that defendant had now made the street the requisite width, and he was fined 10s. and costs.

BUILDING PATENTS.*

APPLICATIONS FOR LETTERS PATENT.

536. D. Thompson, W. H. Thompson, and W. J. Bover, Leeds. Ovens heated by gas. Feb. 3, 1882.

544. G. Otway, Brixton. Cutting bricks, tiles, c., from plastic clay. Feb. 4, 1882.

548. R. George, London. Stoves and fireplaces for heating, ventilating, &c. Feb. 4, 1882.

556. E. Verity, J. M. Verity, and B. Banks, Leeds. Securing and ventilating by sash and other windows. Feb. 4, 1882.

566. T. Redmayne, Sheffield. Fireplaces. Feb. 6, 1882.

568. C. D. Abel, London. Chimney-cowls. (Com. by H. Hahn, Berlin.) Feb. 6, 1882.

615. J. H. Mills, Southampton. Construction of window-sash and door frames. Feb. 8, 1882.

623. H. Leggott, Bradford, and E. Marsh, Leeds. Construction of cooking and other stoves, &c. Feb. 9, 1882.

625. J. Winfield, Derby. Open fire-grates. Feb. 9, 1882.

634. J. Brindle, Southport. Facing walls or buildings with slabs of stone, &c. Feb. 9, 1882.

NOTICES TO PROCEED

have been given by the following applicants on the dates named.

February 7, 1882.

4,253. J. McMillan, Glasgow. Apparatus for feeding fuel to fireplaces. Oct. 1, 1881.

February 10, 1882.

4,324. A. Wightman, Sheffield. Fluid meters. Oct. 5, 1881.

5,397. W. Whitwell, Stockton-on-Tees. Apparatus for heating air, &c. Dec. 9, 1881.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending February 11, 1882.

2,793. J. L. Seymour, New-cross. Venetian blinds.

Instead of nailing the ladder tapes to the top bar and the bottom rail, a plate is fitted to these through slits, in the sides of which are passed and secured the ladder tapes. June 25, 1881. Price 6d.

2,818. W. R. Lake, London. Apparatus for preventing escape of sparks and soot from chimneys.

A cylindrical hood is placed on the top of the chimney, covered above with a slanting plate, in the centre of which is the opening for the escape of the gases. On a spindle in the centre of the cylinder are a number of cones, the diameters of which increase upwards. Round these cones are a series of spiral plates, which catch the sparks and the soot, and force them out into the sides of the cylinder, where, being out of the draught, they fall to the bottom, and can be removed. (Com. by A. Petgold, Berlin.) June 27, 1881. Price 6d.

* Compiled by Hart & Co., patent agents, 28, New Bridge-street.

2,881. A. H. Elliott, New York, U.S.A. Apparatus for crushing and drying or heating stone.

The material to be crushed is first passed through a crushing-machine with jaws, and then through a pair of revolving rolls. A screen separates any lumps larger than are required, and carries them again to the rolls. The dryer consists of a chamber, on the two opposite sides of which are a series of slats inclined inwardly, through which the hot air that passes up from a fire at the lower part has free access to the material contained within. (*Pro. Pro.*) July 2, 1881. Price 2d.

2,883. H. P. Dunnill, Ironbridge. Decorating tiles, &c.

The design is drawn on a lithographic stone. An impression from this is transferred to the tile by rubbing the paper so that the colouring matter is deposited on the tile, which is afterwards burnt. (*Pro. Pro.*) July 2, 1881. Price 2d.

2,914. C. D. Abel, London. Compound resembling wood.

This is made of wood fibre or cellulose, sawdust, dry powder of dextrine, flour, and chalk of gypsum. This is boiled in water, and then rolled into sheets. It is then formed into any required shape for decorative building purposes by being pressed in hot moulds. (Com. by B. Harris, Bohlen, Germany.) July 4, 1881. Price 4d.

2,921. H. J. Haddan, Westminster. Roads and pavements.

The surface of the ground is prepared by concrete and a mixture of hot tar and sand is then poured on, over which is placed a layer of clean pebbles. (Com. by J. Salvat, Morceux, France.) (*Pro. Pro.*) July 4, 1881. Price 2d.

2,945. F. D. Harding, Hampstead. Applying pictures or decorations to door panels, &c.

A thin sheet of metal is used, on which the picture, painted on silk or satin, is stretched. The metal is then secured to the door panel. (*Pro. Pro.*) July 5, 1881. Price 2d.

2,975. E. Johnson, St. Helen's. Manufacture of bricks, tiles, &c.

Instead of using oxide of iron in the making of blue bricks, copper slag is employed, which is mixed with the clay, and before burning the brick. It may be rolled in dry powdered slag to deepen the colour. July 7, 1881. Price 2d.

2,978. H. J. Haddan, Westminster. Chimney-caps.

The cap is made of four angle-pieces joined together with a flange on top to prevent water entering the chimney. (Com. by A. Pichereau, Cailly, France.) (*Pro. Pro.*) July 7, 1881. Price 2d.

NEW WESLEYAN SCHOOLS, BLOCKLEY, MANCHESTER.

THESE schools adjoin the present chapel, and have communication therewith. The buildings comprise on the ground-floor a mixed school, 55 ft. by 39 ft.; connected with the same are five spacious class-rooms, also an infants' school, 32 ft. by 21 ft. Each school has separate hat and cloak rooms and playgrounds. The school-rooms have dados of Staffordshire glazed bricks of selected tints, and the class-rooms pitch-pine boarding; all have open-framed roofs, and are lofty and well lighted. Externally the building is faced with white headers, relieved with bands of coloured bricks and masonry. The roofs are slated with enriched cresting. The schools are warmed by means of hot-water apparatus, and the class-rooms by open fireplaces.

The building has been erected by Mr. R. Whitell, of Barnes Green, at an outlay of about 1,900*l.*, under the superintendence of the architect, Mr. John Lowe, Manchester.

IRON AS A CONSTRUCTIONAL ELEMENT.

ENGINEERS, as a body, have always been fully alive to the immense value of iron as a constructional element, and whenever possible they have utilised this value in preference to the inferior one of timber.

Architects, on the contrary, have been more conservative, and have clung with more fidelity than reason to those simple elements of construction which were utilised by the ancients. Had the architects of the Classic or Gothic eras been fortunate enough to have had at their command such a valuable constructional element as iron is (as now manufactured), there is no doubt that they would largely have made use of it; but in those ages the science of metallurgy was hardly known, and iron was only produced at a great cost.

The readiness of engineers to utilise the triumphs of science and ingenuity partly explains the reason of the widening of the area of their professional scope, and its encroachment on what was once considered the professional territory of the architect.

If architects, instead of adopting systems o construction quite appropriate to the ages o poverty in the choice of constructional materials, would follow the example of the engineers, and utilise, adopt, and invent new applications more in accordance with the advanced stage of applied science, there would be a brighter future for architects in this more and more progressive age.

With all due deference to Professor Kerr, the writer believes that iron will be far more largely used in the constructional work of the future. The only objection against the use of iron for construction is its liability to oxidation; but now we know that science and invention have produced a process for the protection of ironwork from corrosive influences (the Bower-Barff process). It is well known to chemists that iron once *properly* coated with magnetic or black oxide is preserved from further oxidation. The writer has in his possession ornamental plaques, which have been subjected to various influences capable of producing oxidation for upwards of four years, and still they show no evidence of rust. Once this magnetic oxide is coated with paint, the durability of the latter will be very great, owing to the absence of oxidation under the paint,—the latter will not be thrown off,—and also owing to the high heat conductively of iron. The paint will not blister when subject to normal solar heat. Painted timber when subjected to solar heat rays, owing to the low-heat conductivity of timber, does not permit the heat to pass through it, but radiates the heat, consequently producing blisters in the coat of paint.

The intrinsic colour of the magnetic oxide is French grey, but when oiled it becomes a dead black, so that architects desiring the valuable element of durability, by specifying that the iron be coated with magnetic oxide, can obtain the desired desideratum.

It behoves architects on patriotic grounds to utilise the natural resources of their country in preference to those foreign. Nearly all the timber used in this country for constructive work is foreign; and the money value of these timber imports is enormous, and at least a great portion of this value could be retained in this country if architects would follow the example of engineers, and adopt iron in preference to timber for flooring, &c. Iron, when properly embedded in terra-cotta or fireclay, possesses the valuable quality of fire resistance; and certainly the acme of floor construction, both as regards strength, true economy, durability, and resistance to fire, is the combination of rolled joists coated with magnetic oxide and concrete constituted of real Portland cement and calcined aggregate.

B. H. THWAITE, F.C.S.

CLEOPATRA'S NEEDLE.

As the modern additions to the ancient obelisk recently erected on the Thames Embankment are on the eve of completion, the present moment is opportune for making a protest, if you permit, against the ridiculous attitude of the sphinxes in reference to the shaft,—*i.e.*, looking inwards at each other instead of outwards.* The absurdity is so obvious that I will not occupy your valuable space with arguments derived from classical antiquities. It is enough to say that in ancient Egypt these sphinxes were placed as guardians of some structure or other which was specially venerated. Who, in these modern days, I may ask, would think of turning his watchdog's kennel looking towards the house and treasure he placed in the animal's care? The reason assigned for the attitude is, that lines from the apex of the obelisk to the tails of the sphinxes form, with the base line, an equilateral triangle. But surely this is a very insufficient reason in face of the deformity alluded to.

In the announcement of the approaching completion of the work, it is stated that "In May, 1879, the obelisk was washed with two coatings of Browning's invisible solution, which appeared to have preserved its surface."

Experience, I think, shows that this was a perfectly unnecessary precaution. The Duke of York's column on Carlton-terrace, London Bridge, the Victoria Embankment, the monument to the king's gardener in St. John's-churchyard, Kensington, and many other granite structures from thirty to 100 years old, show no signs of decay.

* A protest to this effect has already appeared in our pages. The error should be rectified.

It is evident, therefore, that however rapidly freestone is destroyed by the acid vapours of the London air, granite is safe. It is true that the obelisk shows some signs of decay, but this is entirely owing to its having been partially buried for generations in the damp saline earth of the shore at Alexandria. Long before the erection of this same obelisk by Osirtesen, at On, the City of the Sun (the Greek Heliopolis) more than 3,000 years ago, the Egyptians had made this important discovery, and, consequently, they built their everlasting temples and other monuments of granite upon limestone substructures, upon which the damp alkaline soil has had no destructive effect whatever.

H. T.

PAINTING AND SCULPTURE REGARDED AS ILLUSTRATORS.

SIR,—Judging from the misty discourses upon art with which we are from time to time fogged, *brain-teazing* would seem to be considered absolutely essential to art instruction. Art questions, though among the most difficult questions for solution, are much more susceptible of simple exposition and illustration than the *dilettanti* are apt to suppose. Amateur art expositors would appear to beat about for something extremely recondite in the way of theory before they venture to declaim and to make men stare; and as if they imagined that an artist, before setting to work on either a picture or a statue, sits wrapped in meditation, like a Kant, bent on evolving art out of his own inner consciousness; whereas, in nine cases out of ten, instead of thinking out some puzzle-brain question touching the relation of art to religion, before he sets his palette or piles up his clay, he has very early in his career to determine under what banner he will enlist as an illustrator; for Painting and Sculpture are the illustrators either of religion, philosophy, or of literature, or content themselves with the more servile occupation of copying the common incidents of life.

Art, without in the slightest degree attempting to become didactic, becomes ethical, by associating herself with religion, philosophy, and and poetry. She does not frame her own mood; she enlists, as we have said, under a banner. It is seldom, indeed, that she ever attempts to invent her own subjects, and when she does, it is, as a rule, with very indifferent success. She generally takes up those subjects for illustration with which the world is tolerably familiar, which have vividly impressed the public mind. It is in faithfully and rightly serving under one or other of the banners we have enumerated that Art takes her highest position in the empire of intellect. It is not by an eternal pictorial iteration and reiteration of the Ten Commandments and Watts's Hymns, as some persons would seem to suppose, that art becomes ethical. All that it is good for art to do, *rightly* done, is ethical in its tendency, and contributes, in some lesser or greater degree, to that general atmosphere of rectitude which is conducive to the intellectual health of the community. Persons stalk about discoursing upon art as if they were members of a Salvation Army and chanting pæans whose language is out of all proportion to the occasion, and which are outside the limits of common sense.

Other things being equal, it is in proportion to the intellect demanded for the conception and execution of a work of art that the work takes rank. Mind takes the first rank in art, as it does in the universe. All other qualities, drawing, colour, execution, &c., are as nothing when not utilised for the illustration of either great thoughts or of the beautiful. It is for this reason that the intellectual artist invariably enrols himself under the banner of religion; for the Scriptures contain the history of the aspirations of men's souls heavenwards, and of their struggles and sufferings for truth's sake,—they discourse upon the greatest themes which can stir humanity,—they furnish the most glorious subject-matter for art illustration that can possibly be conceived. Some artists who enlist under the banner of religion may lean to the austere manner, some to the redundant and surcharged, and a few to that better way which is determined by right reason and right feeling. This choice of mode is an ethical choice. The choice of the better way from the worse is in art, as in everything else, to all intents and purposes a moral choice. The souls of men were never elevated one tittle of a degree by all the acres of canvas of Rubens's rollicking art, wherein you may find all the machinery, technical skill, and material resources of art lavished in vain,—to no intellectual and profitable purpose. Those qualities which his works really do possess are, in the main, as vicious in one way as those exhibited in the ascetic art of an earlier period were in another. What is it that places the art of Michelangelo pre-eminent over that of Rubens? There is the same daring and fearless energy in both. Simply the fact that the art of the one is instinct with mental power, whilst that of the other revels, as it were, in mere brute force.

It is to the mental and ethical side that the art of the future will tend; all the resources that a great artist has at his command will be bent to this end. If art be not ethical in its best phases, how is it possible that it can in any degree minister to progress? Art becomes ethical without the slightest taint of pharisaical affectation, as conduct becomes moral by being perfectly proportioned to right ends. It is this unostentatious and unaffected correspondence in the progression of all things towards the best proportions, that they work together for the good. Whatever amount of misdirected thought, labour, knowledge, and skill, be lavished on works of art having other purposes than this, these will, as intellect marches triumphantly onward, be swept away as chaff before the wind.

W. C. T.

BELGIAN IRON.

SIR,—A short time since a statement was circulated in some of the professional journals, that Belgian iron imported into this country and largely used in buildings was exceedingly bad, especially as regards its tensile strength, and it was stated at the Iron and Steel Institute last year that some joists had been found which only equalled a tensile strength of six tons per square inch across the grain.

At the first convenience I had three joists taken indiscriminately from a considerable London stock, and sent to Mr. Kirkaldy for him to experiment upon just as he pleased, and I now send you copies of the certificates I have received.

Comment on my part is hardly needful, beyond that I may specially point to "facts, not opinions," as showing the ultimate mean tensile strength to be 21·7 tons per square inch, and the centre breaking-weight to agree very closely with the published tables of strength.

ARCHIBALD D. DAWNAY,
Assoc. M. Inst. C.E.

ON SANITARY SUPERVISION.

WHEN, after the somewhat recent deaths and narrow escapes of royal personages, we learn that at Bagshot Park it was found on investigation "that a large soil-pipe from a disused closet had been *simply* cut through by a careless workman, and its open end, leading directly into the main drain, was left immediately under the flooring close to the central hall, and thus a continuous stream of sewer gas was poured into the house,"—it would appear that the time-honoured dictum of Horace,—

> "Pallida mors *æquo* pulsat pede pauperum tabernas,
> Regumque turres,"—

is somewhat invalidated, and that death's *impartial* knock is more to be feared or welcomed, as the case may be, in those mansions (*regumque turres*) where simplicity and common sense in sanitary appliances have been neglected;—while in cottagers' homes (*pauperum tabernas*) immunity is somewhat secured by uncomplication. In the beautiful lines of Malherbe it is truly remarked,—

> "Le pauvre, en sa cabane, où le chaume le couvre,
> Est sujet à ses lois,
> Et la garde, que vielle aux barrières du Louvre,
> N'en défend pas nos rois,"—

the surest guardian from preventible disease is, however, the constant intelligent supervision of the skilled sanitarian; but "*quis custodiet ipsos custodes?*"

The following instance came under my notice, showing that all the arrangements, however much out of the way, will require constant intelligent supervision. In a house,—A1 Sanitary Lloyd's,—repairs being required for the roof, the British workman, objecting to the smell from the soil-pipe ventilator, stopped it up with a rag; when the job was finished the removal of the impediment was forgotten. Not long after typhoid fever broke out in the family: this led to universal and complete investigation, and the discovery of the cause of the mischief. Perhaps the narrow escape of another member of the royal family will rouse us to face the ever-impending danger, and cause us to improve sanitary arrangements, which, among high or low, are an absolute disgrace to our so-called civilisation. In sanitary matters there is a vast deal of profession with a corresponding amount of insincerity; and,—as in the burning question of the suppression of drunkenness,—real sanitary progress will only be the result of the gradual education of all classes.

P. HINCKES BIRD, F.R.C.S.

INVASION OF ANTS.

SIR,—Perhaps it may interest some of your readers to know how the "white ant" of India is doctored, for the same treatment might be as effectual upon his black brother. The following are extracts from my note-book:—

To destroy white ants:—50 lb. vegetable wax. When melted pour into it 2 oz. of nitric acid. Apply to ant holes and chinks.

Another method:—

Arsenic	2lb.	4oz.
Aloes	2 „	4 „
Chunam soap	2 „	13 „
Dhobees (washerman's) mud	2 „	8 „

Pound the arsenic and aloes; scrape the soap; mix all these with the dhobees mud; boil in a chattie (earthen pot) half full of water until it bubbles. Let it cool. When cold, fill the chatties up with cold water. Boil again for an hour. Apply the mixture as a wash.

Another method:—

Petroleum oil	10 gals.	or 3 gals.
Arsenic of commerce	4 lb.	or 1 lb.
Sugar of lead	4 „	or 1 „

Mix well; then syringe into holes and crevices. This mixture I commonly used to jail, barrack, and church walls, where the oil did not make an unsightly mark.

On flat roofs we strewed coarse matting well sprinkled with sugar, of which the ants are fond. When the matting got well full of ants, it was taken hurriedly away and burned. Whichever method was adopted, constant attention was necessary. If the "queen" ant could be found, her destruction would ensure the flight of all the tribe.

Sometimes we found that a large voracious black ant attacked, conquered, and drove away the white ants.

Small black ants were very troublesome in the larder, by getting to the food. The only way to prevent their depredations was to place the food upon a table whose legs stood in pots of water, for the ants could not get across the water.

When living in the Cape of Good Hope, my bath-room was invaded one night by an army of red ants. We discovered a large nest under the floor, which we deluged with boiling water, and then carted the remains away some distance from the house. There was no more trouble with them. I hope some of these hints may be serviceable.

COLONIAL ENGINEER.

WOOD PAVEMENT.

SIR,—In consequence of numerous inquiries regarding the system of wood pavement at Norwich, I venture to forward you a copy of my report as to the cost thereof.* I may state that the wood is laid simply on the old formation after it has been cleared to a depth of 5 in., upon a little sand. It is then well grouted and rammed, covered with a layer of fine shingle, which is gradually worn off. No concrete is used, no asphalte or bedding boards. We have some which has been down for three years, and stands as well as any other wood pavement I know of.

P. P. MARSHALL, City Engineer.

Stable Fittings.—Messrs. Steven Bros., of Upper Thames-street and Glasgow, have just issued, in a handy form, the "Stable Fitting" section of their full Trade Catalogue, the illustrations being reduced from the originals. It seems to be very complete, and is likely to be useful. Visitors to the Sportsman's Exhibition, now open at the Agricultural Hall, will find this firm's exhibit of these and other goods worthy their attention.

* It appears to range from 5s. 2d. to 6s. 5d. per yard.—ED.

CHURCH RESTORATION.

MR. C. HODGSON FOWLER, F.S.A., of Durham, lectured before the members of the Leeds Architectural Society on "Church Restoration: What to Do, and What to Avoid." There was a large attendance, and the chair was occupied by Mr. J. B. Fraser, F.R.I.B.A., the president.

At the close of his address, Mr. Fowler said:—He knew it was impossible in this busy century of ours, with the multiplied calls of work on a man, that he could give as much time as he would often wish to a work; but let them give all they could, and they would find that their care and diligence were reflected in those working under them. He was aware that his audience might find many works of his where he had done things he now condemned, but that he expected was the experience of most men, and in work such as he had been describing they sometimes suffered from the well-meant efforts of those working under them. Speaking of the "Society for the Preservation of Ancient Monuments," he said that that society, if its views were taken merely from its prospectus, or from the expression of some of its more moderate members, had nothing objectionable about it; but they must judge its views as enunciated by its principal originators and supporters, and it would, he thought, be found impossible to agree with them. There was no doubt that restoration had often been carried much too far. No one who had any feeling for old work, or who had seen any number of our old churches, could deny it; but, because we knew and lamented it, that was no reason why restoration should cease. The society appeared to forget that churches were built for Divine worship, and simply treated them as monuments. He declined to do so, and looked upon them, firstly, as God's houses, and to be kept in order for His honour, and that could, he believed, be done quite consistently with keeping all their historical and architectural interest. The members seemed to have no care for churches as such, and, therefore, he, as a Churchman, could not belong to it. But though he could not belong to the society, he denied that he was any more destructive than its members. On the contrary, he felt that restoration such as he had advocated was truer preservation than the society's "let alone" theory, which must end in destruction.

MAGDALEN BRIDGE, OXFORD.

NOTWITHSTANDING the endeavours made, the preservation of Magdalen Bridge appears now to be hopeless. The following is a list of the tenders that have been delivered:—

T. Selby, Oxford	£16,469 0 0
T. Jones, Oxford	15,700 0 0
Kimberley, Banbury	15,461 0 0
Buxton, Herne-hill	14,809 14 10
Symm & Co., Oxford	14,487 0 0
Ottoway, Oxford	13,490 0 0
G. Jones, Oxford	13,132 0 0
Cook & Co., Battersea	11,442 0 0
Smith, Leamington	11,434 14 3
Hill, Gosport	11,200 0 0
J. Dover, Oxford	10,534 0 0
Pickall, Bromsgrove	9,810 17 2
G. Moss,* Liverpool	9,372 13 6

* Under consideration.

Quantities were supplied. Mr. W. H. White, surveyor to the Oxford Local Board, is the engineer to the bridge.

TOOLE'S THEATRE.

UNDER this title the rebuilt Folly, King William-street, was opened on Thursday last. We confine ourselves on the present occasion to saying that its architect, Mr. J. J. Thomson, A.R.I.B.A., has effected a surprising improvement in a singularly short space of time. The premises have been enlarged to the west and the north, and the general appearance of the interior is bright and effective. Messrs. D. G. Laing & Son have executed the building and the decorations (which include a new ceiling) from designs by the architect; Messrs. Battiscombe & Harris have provided the *carton pierre*, and Messrs. Strode the lighting. We cordially wish Mr. Toole the success he well deserves.

Electric Bells.—Messrs. Young & Buss, of Blenheim-street, New Bond-street, have just fitted a block of houses at South Kensington with their improved electric bells.

PORTSMOUTH DRAINAGE COMPETITION.

THE arbitrators, Sir Joseph Bazalgette and Mr. Bailey Denton, have selected three designs in this competition to be submitted to the Town Council. They are marked "Multum in Parvo," "M. M. I. C. E.," and "Delta," their respective authors being Mr. C. G. Adames, Borough Engineer, Portsmouth; Messrs. Quick & Son, Westminster; and Mr. Llewellyn Lloyd, C.E., London, formerly town surveyor, Bilston. The premium offered by the Corporation was 500 guineas.

GAS-ENGINES.

OTTO *v.* LINFORD.

THIS was an appeal (heard before the Master of the Rolls and Lords Justices Brett and Holker) from a decision of Vice-Chancellor Bacon dismissing, with costs, an application made by the plaintiff for an injunction to restrain an infringement of patent, on the ground that the patent was anticipated, and the subject-matter of it published to the world in the specification of another patentee. He also intimated an opinion not favourable to the plaintiff on various other points which were the subject of discussion on this appeal.

The Master of the Rolls, in concluding an elaborate and lucid judgment, said:—The infringement is made out, and the decree of the Vice-Chancellor will be reversed, and the plaintiff will have his injunction, with costs.

Lords Justices Brett and Holker concurred.

Judgment accordingly.

THE NEW SYSTEM OF COMPETITIONS.

SIR,—Referring to my letter of Dec. 17th, published in your journal, on the subject of competitions, I think it desirable, in the interests of the profession, to call attention to the actual working out of the new system.

For example, the conditions, which have already been partially published, for the final competition at Glasgow, require a complete set of plans, to a scale of ¼-in. to a foot, of each floor and roof, viz.: six plans, four elevations, two or three sections, one perspective view, making in all thirteen or fourteen sheets of drawings, each of which (excepting the view) will measure at least 3 ft. square; and all to be finished in pen and ink, partly coloured. In addition to these, plans of warming, ventilation, and sanitary arrangements will either have to be incorporated on the above, or separate drawings made. Practically at least 60 to 70 superficial feet of paper will have to be covered with elaborate drawing, for each set, and this has to be multiplied by ten.

It follows, therefore, that the architects will be put to this great labour and expense, merely to enable the council and assessors to arrive at a decision, the bulk of the work being simply an enlargement of what has already been before them. No reasonable objection could be taken to two or three plans, one elevation, and sections sufficient to show clearly what is intended (though even for these one-tenth scale would be ample); but no satisfactory system of construction, sanitation, &c., can be devised until the exact requirements are known, and the working drawings got out for execution.

Instead of reducing the labour and cost to competitors, the new system bids fair materially to increase it, as the Institute's recommendation to make a sufficient payment to cover the cost has not been adopted. Half per cent. to the successful man, and one to two per cent. divided amongst the unsuccessful, have been mentioned as a fair remuneration, but in this case the amount which the Glasgow Council propose to divide is not much more than half per cent. distributed equally amongst the whole ten.

A clause of a very one-sided kind has been introduced, by which, if the four selected competitors fail to obtain a tender satisfactory to the Council, they may each be superseded, which will render their position uncertain and unsatisfactory. In ordinary cases two and a half or three per cent. on the builder's tender would be due at a corresponding stage in the work, but the Glasgow Council would not be liable for more than 150*l.* to each of the selected men in their turn. Of course it is hardly likely to come to this, but the conditions are hard.

Do you not think, sir, that these circumstances would amply justify a firm, united, and respectful protest to the authorities at Glasgow against such unreasonable requirements as they have, no doubt unintentionally and without realising the effect of their instructions, imposed upon the selected ten competitors?

OBSERVER.

COMPETITIONS! COMPETITIONS!

SIR,—It is quite possible that the decision of the judges, *in re* the Blackfriars Bridge competition, was perfectly fair and equitable. But after that flourish of trumpets which invited artists to the tilt, would it not have been more satisfactory to the public if the public had been admitted to be spectators of the joust? There appears to be almost invariably a falling through in these enterprises. Is it the fear which ignorance in art begets that makes art committees utterly undecided and un-English in dealing with matters of taste? I fear that this must be the case, and that art committees are conscious that they do not know how to set about their work.

There is now another competition advertised for designs for the sculptures to decorate St. George's Hall, Liverpool. The advertisement embodies the usual stock uncertainties. Artists are invited to compete, and to send in twenty-eight designs half size,—that is to say, from 2 ft. 2 in. to 2 ft. 9 in. square,—which, as you must very well know, sir, would require, to do them roughly, at least six months of the artist's time,—and yet without the slightest guarantee that the successful artist's work shall be carried out; or if carried out, that he himself shall execute them. Nay, there is not even the promise that the works premiated shall even remain the property of the artist. Now, any set of designs of the given size, and worthy of being premiated, would, at the most moderate computation, be worth five or six hundred pounds. But, I maintain, that the time given, as was the case in the Blackfriars Bridge affair, is totally inadequate to do justice to such a set of designs.

Art committees that resolve upon opening a competition should go more systematically to work. The first thing which ought to be decided is the subject or subjects to be designed. There might even be premiums offered for the best suggestions, after which a mixed committee of literary men and artists might determine this point. There would then be fair ground on which artists would be invited to compete. What can come of competitions concerning which neither committees nor artists have any definite notions? The subjects being decided, even if the competition were not an open one, there would be some guide to a selection of artists.

DRILL.

A SERIOUS CHARGE.

SIR,—I have been for upwards of forty years a working painter, and also a foreman of painters and decorators round Belgravia, and I am still in the employ of a very old firm not far from that neighbourhood, and being a thoroughly practical man I wish to expose the following most abominable system which is now practised by two or three firms I know of. If the practice is not altered I will publish several handbills at my own expense, and expose the parties that are acting in this manner.

The firm I am now working for have a contract a few miles from town, supposed to have three coats of good oil paint and a flat, and to be completed in a workmanlike manner. It has been washed and had but one coat and considered finished. What are the surveyors about? Are they blind? Labourers are now employed by several firms to do what painters only can do, and the employers are thus robbed.

I think this, sir, will open the eyes of the right parties if you will kindly insert it. I will send you shortly another account respecting a job I am now conducting. Unless I make one coat do for two, my employer is not satisfied.

T. M.

Value of Land at Chiswick.—Mr. Walter Hall, land agent and surveyor, of 28, Southampton-buildings, Chancery-lane, has sold by private contract, for the sum of 11,220*l.*, the whole of the Duke's Avenue Estate, advertised for sale by auction. The property, which is situated close to Bedford-park, comprises seven acres of freehold land, and covers the whole of one side of the avenue. The price realised is said to be the highest yet paid in that neighbourhood.

ROOF COVERINGS.

Sir—I am puzzled to know what sort of roof I should put up for a covered-in cattle-shed on a farm in the fen-land here (Boston), about six or seven miles from the sea, the country being very flat and low.

I at one time thought of using galvanised iron, but cannot assure myself of its durability under the circumstances that it has to contend against dampness internally and externally, as well as the gases, exhalations, &c., from manure and the dung of cattle.

The roof I wish to erect I want to resist wind-stripping, and which, in this neighbourhood, seems to be of frequent occurrence.

I should like to be informed of the merits and demerits of slated, iron, or other roofs under those circumstances, and I should be greatly obliged if I could obtain information respecting the same through your correspondence column, as well as answers to the following questions:—

1. What is the best roof to erect under the foregoing circumstances?

2. If slate, why? And what provisions should be made or precautions taken to insure its non-liability to wind-stripping?

3. If galvanised corrugated iron, state gauge recommended and what advantages it has over a slated or other kind of roof, and what length of life it would have under the above-mentioned circumstances?

4. What effect have dampness, gases, exhalations, &c., from the dung and excreta of cattle upon corrugated galvanised iron? Also state how they can be prevented.

5. Would you recommend or advise any other kind of roof? If so, why? And what advantage has it over any other? Ionomy.

*** Our correspondent is unreasonable in his requirements; however, we give him the chance of a reply.

SKILLED WORKMEN.

Sir,—I beg your kind permission to add a few remarks on the above subject.

Your correspondent, "Common Sense," attributes the case of the existing state of affairs to the actions of the trade unions, and I am quite prepared to endorse his opinion, in so far that unionism has a great deal to do with it, and much to answer for, inasmuch as it certainly perpetuates, or at least aggravates, the evil, the primary cause of which, I think, is due in a great measure to the force of circumstances.

Take, for instance, a lad at the commencement of his career (I allude to the building trades). Suppose he is apprenticed in one of the branches, what are the chances in his favour in respect to learning his trade? No one needs to be told that the old system under which there were trade-masters in every branch, who invariably took apprentices that were legally bound to serve them, and they were equally bound to teach them their trade, has entirely disappeared,—it may be never to return.

These are superseded by the general contractor; but these are men of commerce, and have no opportunity, even if they had the will, to watch over the conduct of an apprentice and teach him a trade.

Moreover, a contractor, even if he has been trained as a practical workman,—some have not,—only knows one branch: then how could he teach an apprentice in any branch other than his own? Therefore it follows, as a matter of course, the lad would be placed in charge of the foreman; but this man has no personal interest, pecuniary or otherwise, in the lad, who, in turn, owes him no allegiance, and it would be a matter of surprise if the foreman took any pains to teach him; he would most likely leave him to the mercy of the journeymen, who having, if possible, even less interest in his welfare than the foreman, are less inclined to bestow any favours upon him.

Now, it requires no stretch of the imagination to picture the position of a lad under such circumstances, and to estimate the chances he has of learning his trade. It is more probable that when he has managed by hook or by crook to pick up a little smattering of his craft, he will take himself off, and his master would find it more profitable to let him go than to put himself to the consequent trouble and expense of forcing him back again.

It seems tolerably clear that the system of apprenticeship must, like the old trade masters, disappear altogether, and in its stead is springing up a sort of loose method by which so-called skilled workmen are "manufactured," if I may use the term. Doubtless, in some instances it is done in a fairly legitimate manner, and may bring some good results; but in the majority of cases lads or young men, whether mentally or physically adapted, or having any especial taste for a particular craft or not, are, so to speak, smuggled into it; and, in cases not a few, smuggle themselves into it. This kind of thing is well known both to employers and men, and winked at by all.

The greatest evil belonging to this method of manufacturing craftsmen lies in the fact that they are made too quick; they burst into full-blown journeymen by the time an indentured apprentice would have served half his term. And then it is that unionism does its work upon these prematurely developed artisans; they are accepted as members of the lodge, are put on an equality with men some of whom are more than twice their age, and supported in their claim to be paid the full rate of wage, although in too many instances they are, in comparison, not worth more than half the amount.

Moreover, employers have largely contributed to this state of affairs; for, partly in submission to the dictation of the unions, coupled with supineness on their own part, they have allowed to grow into an established fact a system by which all hands in each particular branch are without demur paid at a uniform rate of wage regardless of any classification as to degree in skill, something akin to dealing with a flock of sheep, but with this difference: in the one case the purchaser makes use of his experience in striking an average value, and the vendor finds it to his interest to get them into the best possible condition so that he may command the highest market price. On the other, the purchaser pays the highest average without regard to value, and the vendor has no inducement to improve the condition, *i.e.*, "skill," because the price is secure beforehand.

This system is at once the strongest weapon in the hands of the unions; the greatest hindrance to advancement in the *status* in skill and industry, because it destroys emulation, which is the life and soul of progress; and is also downright injustice to the individual workman, who gets no more remuneration for diligence and superior practical knowledge than one who is deficient in both, and shows no disposition to apply himself to attain them.

One of the Old School.

ELECTION OF BOROUGH SURVEYORS.

Sir,—I take advantage of the great circulation your well-known journal has among borough surveyors, &c., to appeal through it to them to see if some scheme can be devised towards placing the competitions for appointment to situations on a better footing. The town of Beverley advertised in your columns in the usual manner for a Borough Surveyor at 140*l.* salary. There were 102 applicants, four of them were selected to appear before the committee, who elected one; but at the Town Council, a few days after, he was displaced to make room for a personal friend who had not competed, being in a situation at a higher salary than that offered, and who would not accept the post unless allowed 30*l.* per year more than advertised. The above is but one instance out of many. Surely, when we consider the difficulty there is in procuring such appointments owing to the great competition, there might be some means taken to insure fairness at these elections. Surveyor.

VARIORUM.

Colburn's *New Monthly* (E. W. Allen), under the heading, "Great Companies and Trading Firms," contains accounts of the works of Messrs. Hooper & Co., coachbuilders, and those of Messrs. Cox, Buckley, & Co., church furniture makers. We take a paragraph from the former as to the woods used by the carriage-builder:—"Very elegant show-carriages are made in Paris, but many of them would in many cases suffer if taken off the smooth pavements of that luxurious and elegant city. English carriages, on the contrary, are built for use and comfort, and while no efforts are spared to render them shapely and elegant, the builder never forgets that they will have to travel over roads that are not as smooth as a billiard-table. No less than thirteen kinds of wood are used by the carriage-builder. Ash is to him of most value, next pine and mahogany, then elm and oak. Where there is much exposure to the moisture, acacia is employed, as it offers more resistance to wet than any other kind of wood. From three to four years are allowed for the wood to season, and even then it is cut into small lengths, and put into racks for some months, before it is used. The 'body' is made by one set of workmen, the 'under-carriage' by another. The former is delicate, and the labour is not unlike cabinetmaking, while the latter nearer approaches carpentry. The manipulation of the panelling is one of the prettiest processes in carriage-building. Sometimes a panel several feet wide will be bent in such a way as to give two, three, or four distinct and graceful curves. It is done by wetting the wood on one side, and then exposing it to heat passing through an iron pipe."——We get the following graphic description of *Broadway, New York*, from "Cities of the World" for February;—"Broadway is the main street of New York, and the most brilliant thoroughfare in America. Indeed, it would be impossible to find in Europe itself a street which is characterised by such tremendous activity, such diversified and ambitious architecture, and such an air of metropolitan splendour, wealth, and life. The great avenues of trade which run from Trafalgar-square or Hyde Park to the Royal Exchange, the arcaded lines of the Rue de Rivoli, the busy Graben of Vienna, the Via Roma of Naples, none of these can sustain a comparison with the grand artery of the New World, through which course from sunrise till evening strong currents of the most electric life of the nineteenth century. The noble width of the street, so favourable to architectural effects and long vistas; its great length, of fully five miles, nearly one-half of which is absolutely straight; and its central position on the island, with long streets, crowded with stately buildings, diverging on either side: all these are the advantages of position, which serve to set off to the best advantage the cosmorama of humanity which continually surges along the pavements. Broad as the roadway is, so great are the numbers of carriages, omnibuses, and wagons always in motion there, that it becomes an affair of no small peril to cross it, and the most stalwart and handsome officers of the police force are stationed at the corners to escort ladies from one side to the other. Some years ago an iron bridge was thrown over Broadway, near Fulton-street, so that pedestrians could cross in safety. Never was there such a heterogeneous architecture as is here displayed, where the Greek and the Gothic, the Romanesque and the Renaissance, are crowded side by side, but all in a manner harmonised by the distortions which the urban architects of America are forced to plan in order to insure the three prime essentials in a modern building,—light, air, and space. New York *dilettanti* ruefully recall Mr. Ruskin's celebrated dictum (*Fors Clavigera*, No. 1) that before the science of building can become respectable on this continent, their city must be razed to its foundations. The classic harmony of Pall Mall, the restful uniformity of the Parisian Boulevards, are lacking here, where all is strongly individualised, and the narrow shop-fronts along a single square exemplify every style and colour. Iron is largely used as a building material, and long colonnaded façades, simulating marble or brown stone, are composed of iron castings riveted together. The colossal hotels, rivalling the Midland or the Parisian Grand; the newspaper offices, dwarfing the High-street of Edinburgh, with their ten and twelve stories of altitude; the banks and insurance buildings, of marble, granite, iron, in transformed architecture of Palladio, of Viollet-le-Duc, of Yankeedom undisguised; the shops and warehouses, sometimes larger than Roman *palassi*, and replacing their dead walls with wide expanses of glass: all these follow each other in bewildering succession, with the unceasing roar of the street between, and the vivid blue sky overhead."——The Clarendon Press will publish very shortly a "Treatise on Rivers and Canals, relating to the Control and Improvement of Rivers and the Design, Construction, and Development of Canals, by Mr. L. F. Vernon-Harcourt, M.A., C.E. The author describes the physical characteristics of rivers; the method and formulæ for measuring their discharge; and the various works, structures, &c., for improving rivers and for forming canals. The causes and means of prevention of floods in river valleys are also discussed.——The touching story of Mrs. Hemans's devoted life, in connexion with her poetic gifts, as the "Songstress of the Household," will be told in the March number of the *Quiver*. The paper, which will be suitably illustrated, is from the pen of Mrs. Raymond Pitman, author of "Heroines of the Mission Field," and forms one of a series of charming sketches of "Consecrated Womanly Genius."——Mr. Thomas Burt, M.P., whose practical acquaintance with the subject is well known, will contribute a paper on the "Tyneside Collier, at Work and at Home," to the forthcoming number of *Cassell's Magazine*.

The Lyceum Theatre.—The Building Act Committee of the Metropolitan Board of Works have reported the receipt from the Superintending Architect of the Board of a report, accompanied by plans, as to the present arrangements for the egress of the audience from, and the prevention of the spread of fire in, the Lyceum Theatre, and the improvements which it was desirable to effect there; and recommended that the matter should be referred back to the Committee, with power to act, with a view to the Solicitor taking the necessary proceedings to enforce the provisions of the Metropolis Management and Building Acts Amendment Act, 1878. The report was adopted.

Miscellanea.

Fatal Building Accident in Oxford-street.—Dr. Danford Thomas opened an inquest on Tuesday at the Middlesex Hospital respecting the death of George Carter, aged 18, who was killed on Friday, the 10th inst., by the fall of a staging at the corner of Thomas-street, Oxford-street. The premises on which the deceased was at work are being built on land the property of the Duke of Westminster, from plans prepared by Mr. J. S. Moye, architect, for Mr. Hollis, a pork-butcher, who acts as his own builder, and employs as his foreman Mr. William Riddell, under whose superintendence the staging was erected. Riddell and other witnesses said that they considered the timber of which the scaffold was constructed to be good, but Mr. William Niblett, a builder and contractor, said that in his opinion the timber used was unsafe, and that the construction of the staging was imperfect, and was not calculated to carry the weight of bricks placed on it. The inquiry was ultimately adjourned for further evidence. From inquiries made on the site of the accident, we learn that the portion of the staging which fell was about 12 ft. long and 11 ft. wide. The platform, consisting of 9 in. by 2 in. planks, was carried by cross joists resting on horizontal timbers. These joists had a bearing of about 10 ft., and were six in number, five being of 7 in. by 3-inch scantling, and one 6 in. by 6 in. These were placed about 2 ft. apart from centre to centre. Not long before the accident occurred some bricks had been stacked on the staging, there being, we are told, about 4,000 bricks on the platform, or about 8 tons in weight, at the time of the accident. The foreman having noticed that some of the joists bulged a little, he instructed the deceased to put in a strut or two under them. Before this could be done, however, the joists gave way, and the deceased, who was taking measurements for the struts, and a labourer who was engaged in screening sand, were unable to escape from under the staging. The labourer's injuries were not very severe.

The Smoke Abatement Exhibition.—On Saturday afternoon last a number of the members of the Royal Institute of British Architects visited this exhibition, which was closed on Tuesday last, when the exhibitors held their final meeting. Mr. Ernest Hart, who occupied the chair, said the sole object of the exhibition had been to solve the problem of how to abate the smoke nuisance. They could not pretend that that problem had been entirely solved by anything seen at the exhibition, but it showed, both as connected with private houses and with every variety of industry, that smoke was capable of being abated. Reporters had been sent to the exhibition by the following Governments:—France, Germany, the United States, Switzerland, Austria-Hungary, Prussia, Sweden, Denmark, the Netherlands, China, Canada, and Australia. Mr. Shaw Lefevre, the First Commissioner of Works, had caused several of the exhibits to be purchased for trial in the public offices. The total number of visitors to the exhibition had been 116,000. Of these, the larger proportion had had free admissions presented to them. As to the receipts, they amounted to quite as much as the committee had expected they would. The testing of exhibits alone had cost 1,000*l.*, or nearly that amount; and when everything was paid, he expected the funds would be at least 800*l.* deficient. They would, however, know how to meet it.

Bad Building Materials.—At the last meeting of the Metropolitan Board of Works, the Building Act Committee recommended that the Vestry of Paddington, in reply to their letter requesting the Board to take the necessary steps during the ensuing session of Parliament for obtaining powers to prevent the use of road scrapings, road sweepings, or slop, in the building or internal plastering of new or altered houses, should be informed that the Board would note the communication in the event of further legislation, but that it could not be dealt with in the present Bill before Parliament, as the notices required by the standing orders of the House of Commons which had been sent out did not allude to this subject.

The Marquis of Londonderry's Stables in Mayfair.—To the description of these buildings given on p. 143, *ante*, we are requested to add that 144 yards superficial of the flooring (on the first floor) were laid with "Brunswick Rock Asphalte Paving," under the personal superintendence of Mr. William Hirst.

Liverpool Art-Club.—A *conversazione* was held on Monday evening at the Liverpool Art-Club, Upper Parliament-street, at which several hundred ladies and gentlemen assembled. Mr. Benson Rathbone presided. There was a paper read by Mr. A. H. Mackmurdo, A.R.I.B.A., on "Architecture and its Influence." In the course of the paper the lecturer said that architecture at the present day was only just awakening from a sleep in which it had been wrapped for well nigh 200 years. Building, however, was awake and active, and the result was what they saw and deplored. Speaking of the mission of architecture, he said that its first and most important work was to house the citizens of a State; next it had to provide the buildings required by a people for its commercial business; and last, but not least, buildings for their common worship. It had, in its higher uses, to express and minister to the unity and domesticity of the family, the stateliness of our civic life, and the supremacy of our political relations. From this, its great necessity and consequent dignity, architecture had always held the chief place among the fine arts. It had, of all the arts, undoubtedly the widest appeal and the largest destination, and required in its production the greatest combination of human faculties. A cordial vote of thanks was passed to Mr. Mackmurdo, upon the motion of Mr. Philip Rathbone.

Property at Fulham.—In the Sheriff's Court, Red Lion-square, a few days ago, before Mr. Under-Sheriff Burchell and a special jury, the case of Herd and others, *v.* the Guardians of St. George's Union was heard. This was a claim to compensation on the part of the owners of certain undivided moieties in premises and land, situated in the Fulham-road, required by the Guardians for the construction of their workhouse. Mr. V. Buckland estimated the value of these properties, including 10 per cent. for forced sale, at 10,131*l.* 10*s.*; Mr. E. Tewson, at 10,009*l.*; and Mr. W. Rex, at 11,233*l.* On behalf of the Guardians, Mr. Spencer Chadwick was called. His figures gave a total of 5,150*l.* Mr. F. T. Galsworthy put the value of the properties at 5,777*l.* The jury, after a short deliberation, gave a verdict for 8,000*l.* The Under-Sheriff: Then by consent the judgment will be for a moiety, 4,000*l.*

The Berlin Hygienic Exhibition and Theatre Architecture.—The *National Zeitung* of Berlin announced some time ago that the committee of the above exhibition had expressed its willingness to receive models and plans tending to promote the security of theatres against fire. It was, however, subsequently decided that the best way to secure the result aimed at was the opening of a competition with a view of arriving at the best principles for adoption in the building of theatres. The funds of the exhibition not allowing the committee to offer pecuniary rewards, an appeal has been made to those interested in the question, to show their appreciation of its importance by contributing to the object named.

Cambridge Slade Professorship.—At a meeting of the electors of the Slade Professorship of Fine Art, Mr. Sidney Colvin, M.A., Fellow of Trinity College, was re-elected Professor for a further period of three years. The Professor is required to give annually to the University, in full term, and free of charge as regards members of the University, a course of not less than twelve lectures on the history, theory, and practice of the fine arts, or of some section or sections of them. He is not required to reside in the University. The stipend of the Professorship is about 360*l.* per annum. Mr. Colvin was first elected Professor in 1873, in succession to the late Sir Matthew Digby Wyatt, and is now elected for the fourth time.

Proposed Statue to Carlyle.—At the meeting of the Metropolitan Board of Works, on the 10th inst., a letter was read from the Rev. G. Blunt, rector of Chelsea, and Mr. H. B. Mitford, secretary to her Majesty's Office of Works, stating that a Committee were desirous of erecting a statue to the memory of the late Thomas Carlyle on the Chelsea Embankment, immediately opposite to Cheyne-row, and asking the Board to give their sanction to the proposal. The communication was referred to the Works and General Purposes Committee.

Eaton Hall.—According to the *Athenæum*, Mr. Shields has just completed some important stained-glass decorations for the chapel of Eaton Hall. They are intended to illustrate the "Te Deum." These windows have been executed, under the designer's direction, by Messrs. Heaton, Butler, & Bayne.

Staverton.—Progress is being made in the restoration of the church of St. George at Staverton, near Totnes. The chancel was renovated some few years ago, and now, under the direction of Mr. Ewan Christian, architect, and mainly at the expense of the Ecclesiastical Commissioners, the nave and aisles are assuming a more seemly appearance. The "pues" are all swept away now, and new open benches are in progress. The general contractor is Mr. Evans, builder, of Paignton. The restoration of the old rood-screen has been entrusted to Mr. Harry Hems. This screen was erected in the fifteenth century, and is of oak. It measures over 50 ft. long, independently of its two handsome parcloses. A solid moulded oak sill is being put through the entire length, and the upper parts are being tenderly cared for. Mr. Hems has also the restoration of the old Jacobean pulpit and prayer-desk in hand.

Stone Circles.—At the fifth meeting of the British Archæological Association, the first paper read was on the Stone Circles at Duloe, Cornwall, by Mr. C. W. Dymond, F.S.A., and it was illustrated by a carefully-prepared plan of the remains from an actual survey. The circle has been described by various writers, with but little regard to accuracy. The dimensions are small, being but 44 ft. from stone to stone in the greatest diameter, and there are but eight stones, the dimensions of each being given in exact detail. The site is an elevated one, and the pure white material of the stones must have made the monument a very visible object when the country was more open than at present. There is no appearance that the stones were ever covered over by a mound, as is the case with similar stone circles elsewhere.

A National Museum of Hygiene in America.—The Surgeon-General of the United States Navy, in a circular letter of the 10th inst., calls attention to the establishment of a National Museum of Hygiene at Washington. The museum, says the American *Sanitary Engineer*, is designed to illustrate the progress made in this country in all departments of hygiene; and architects, manufacturers, physicians, inventors, and others interested, are desired to contribute to the collection articles, models, drawings, or descriptions of any appliances or methods for improving the general sanitary condition. The museum has been made the central depository of the American Public Health Association.

Canvassing Prohibited.—At a recent meeting of the Metropolitan Board of Works, the Building Act Committee reported that they had carefully considered the question (referred to them by resolution of the Board) of the desirability of permitting candidates for vacant district surveyorships to continue the system hitherto in vogue of personally canvassing the members of the Board, and they were of opinion that it was undesirable that candidates for the office of district surveyor should personally canvass the members of the Board. The report was adopted.

Messrs. Robert Boyle & Son are at present applying their air-pump ventilators and system of ventilation to the Council Chamber at the Guildhall. Many ineffectual attempts have been made to ventilate this building, and the results of Messrs. Boyle's efforts will, no doubt, be looked forward to with interest by architects, especially when it is mentioned that the patentees have guaranteed complete success. The system is also at present being applied to Normanhurst Court, the residence of Sir Thomas Brassey, M.P.

The late T. S. Robins.—The works of this artist (a late member of the new Society of Painters in Water Colours), comprising views in England and Wales, Holland, France, Belgium, Germany, Switzerland, and the Rhine, and a large number of admirable sketches of shipping and craft of the past, will be sold on Feb. 23, at Messrs. Christie's rooms.

Brockham.—On Thursday, the 9th inst., the Brockham Brick Company entertained their permanent staff at the Barley Mow, in Betchworth-street. About sixty men sat down to supper, under the presidency of Mr. Alfred Bishop, the secretary, supported by Mr. Manwell. "The Company" was toasted with enthusiasm, and the cordial spirit displayed augurs well for its future.

Clerkenwell Parish Church.—It is proposed to restore the ancient church of St. James, Clerkenwell, and already a handsome sum has been subscribed for this purpose.

TENDERS

For new warehouse at Bow Common, for Mr. E. Birnbaum. Mr. H. H. Collins, architect. Quantities by Messrs. Batstone:—

Merritt & Ashby	£6,633 0 0
Dearsby	5,558 0 0
Bangs & Co.	5,365 0 0
Kirk & Randall	5,344 0 0
Johnson	5,272 0 0
Holliday	5,195 0 0
Williams & Sons	5,050 0 0
Abrahams	4,941 0 0
Perry & Co.	4,891 0 0
Sabey & Son	4,890 0 0
D. King & Son	4,847 0 0
Croaker	4,780 0 0
Nightingale	4,737 0 0
J. Morter (accepted)	4,692 0 0
J. R. Hunt	4,674 0 0
Roberts	4,600 0 0

For the erection of warehouses and other premises in High-street, Shoreditch, for Messrs. Woodhead & Clarke. Mr. J. W. Brooker, architect:—

First Contract.

Taylor	£7,033 0 0
Forrest	6,382 0 0
Goodman	5,899 0 0
W. Downs	5,757 0 0
Crockett	5,476 0 0
Lawrance	5,373 0 0
Morter	5,095 0 0
Shurmur	4,932 0 0
W. & F. Croaker (accepted)	4,920 0 0
Sharman	4,860 0 0

For the erection of Methodist Church in Stansted-road, Forest-hill, to accommodate 300 persons. Mr. J. W. Brooker, architect:—

T. & F. Drake	£1,496 0 0
Redman	1,345 0 0
Bowyer	1,250 0 0
W. & F. Croaker	1,220 0 0
Vincent	1,198 0 0
Hubble & Trott	1,185 0 0
Battley	1,160 0 0
Steed Bros. (accepted)	1,130 0 0

For the erection of a pair of villa residences at Bedford, for Mr. R. N. Bray. Mr. George F. Holt, architect:—

Sims	£1,737 0 0
Danells	1,271 0 0
Leonard	1,250 0 0
Weston	1,200 0 0
Lodge	1,160 0 0
Hishcock	1,150 0 0
Abrams	925 0 0
Walker	880 0 0
Riddle	860 0 0
Philips	850 0 0

For house, Clarendon-road, Watford, Herts. Mr. C. P. Ayres, architect. Quantities by Messrs. Nixon & Raven:—

Andrews & Sons	£1,822 10 0
Clifford & Gough	1,477 10 0
Neal	1,450 0 0
Brown	1,450 0 0
Turner	1,398 0 0
Chadwick	1,368 0 0

For new Board schools at Bromley-road, Lee. Mr. E. R. Robson, architect. Quantities by Mr. Ch. W. Brooks:—

F. Higgs	£6,402 0 0
W. Oldrey (late Hook & Oldrey)	6,356 0 0
F. & F. J. Wood	6,265 0 0
Atherton & Latta	6,248 0 0
W. Tongue	6,196 0 0
Kirk & Randall	6,173 0 0
S. J. Jerrard	6,144 0 0

For alterations and additions to the Queen's Hotel, Abingdon, for the Queen's Hotel Company. Mr. G. Winship, architect. Quantities supplied:—

E. Williams	£146 0 0
Barrett & Drew	138 0 0
G. Thatcher (accepted)	130 0 0

For laying on water, and fitting up bath, cistern, &c., at the same:—

C. Campion	£69 10 0
E. G. Shepperd	68 10 0
Coxeter & Sons (accepted)	53 15 0

For shops and offices, Lawrence-lane and Trump-street, City. Messrs. Ford & Hesketh, architects:—

Higgs & Hill	£11,380 0 0
Hall, Bedall, & Co.	10,938 0 0
Adamson & Son	10,854 0 0
Dove Bros.	10,831 0 0
Scrivener & Co.	10,645 0 0
Brass	10,623 0 0
Shaw	10,492 0 0
McLachlan & Sons	10,433 0 0
Peto Bros.	10,335 0 0
Simpson & Sons	10,090 0 0
Perry & Co.	10,076 0 0
Ashby & Horner	10,072 0 0
Lawrance	9,889 0 0
Ashby Bros.	9,781 0 0

For the extension of the sea-wall, and other works, for the Harbour of Carnarvon. Mr. Frederick Jackson, engineer. Quantities supplied:—

E. & R. Jones	£8,267 16 3
Whitaker Bros.	7,991 10 0
J. & J. W. Roberts	6,891 0 0
Owen Morris	6,757 0 0
E. & T. Jones	6,610 10 2
Evan Jones	6,280 0 0
S. P. Owen	5,697 12 0
D. Williams	5,453 14 8

For the erection of a detached villa residence at Anerley Park, Penge, for Mr. Chas. Rolls:—

J. O. Richardson, Clapham and Peckham (accepted)	£1,040 0 0

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